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# Journal
of the
# Royal Naval Medical Service.

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EDITED BY

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AND

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## Editorial.

Throughout the past year Great Britain has been forging new chapters in her island history, and the schoolboys of posterity will thrill to the epic of this dazzling if not decisive war phase, just as their ancestors were stirred by the drama of the Spanish Armada and the picture of a fretting and impatient Bonaparte gazing hungrily from Boulogne across the Straits of Dover.

The panorama of war has broadened and its tempo quickened ever since the Teutonic descent upon Denmark and Norway. The crushing of these unhappy lands and the rape of Holland and Belgium were the predestined fate of the small neutral nations, but when France fell too, the blow was for the moment a stunning one and almost unnatural in history. Nevertheless Great Britain, still staggering from the blow, resolved to carry on, and the entry of Italy into the fray at this critical point merely excited her contempt. A threefold stimulus kept her spirit high: an awareness of the British Navy ever ready and watchful about her shores, admiration at the almost impudent challenge of her plucky airmen, and the growing realization that in England's hour of need the Western Hemisphere was bestirring itself on the side of freedom for the individual man.

Later in the year the centre of gravity shifted from North and West to South and East, and the world turns its thoughts to the Mediterranean. Nor is action still further East outside its reckoning.

The supreme event of 1940, however, was the abandonment, at all events for the time being, of the project of invasion of these shores; the Hun baulked in his much vaunted grandiose schemings, and England, her second wind achieved, more menacing than ever.

In all this march of bloody events the medical branch of the Royal Navy has taken a very full share, and we proudly record the distinctions so [illegible] prepared by [illegible] Medical Officers and [illegible] of the Royal Naval Volunteer Reserve. Norway and [illegible] landings, and the Hook of Holland, Dunkirk, the fighting part of Northern France, Gibraltar and Alexandria, and in our Home Seas [illegible] the devotion to duty and [illegible] of the Medical Officers of the Royal Navy. Many young lives of great promise have been cut short in the [illegible].

The development of [illegible] and Plastic [illegible] centres, the opening and establishment of [illegible] and [illegible] the steadily [illegible] skill displayed each day in the hospitals at our Naval bases and elsewhere [illegible] and [illegible] and [illegible] [illegible].

There has been a great increase in the ranks of the profession since the outbreak of war, and the knowledge brought by our temporary colleagues of Surgery [illegible] and not least psychiatry have all contributed to the progress [illegible]. The officers of the Royal Naval Volunteer Reserve have found themselves and having learnt to turn their diverse knowledge to Service ends are now pulling their weight in [illegible] fashion.

Amid all these alarums and excursions of war [illegible] one may profitably inquire how the Journal has been faring throughout this fateful year. Its lot has not been altogether happy, and in certain respects its difficulties are increasing. On the other hand its scope and interest have been much enhanced by the contribution of fresh and lively minds. Its troubles are chiefly of a technical character: [illegible] ever rising prices, shortage of paper, publishing difficulties, delay in correspondence, a rigid censorship and so forth. There has been a welcome increase in the circulation, and the Editors trust that within wartime limitations the Journal may be regarded as reflecting all the many aspects of our professional activities. The war has brought to the fore several new problems, for instance the treatment of burns and shock, medicine as applied to aviation, psychiatry—bristling with pitfalls for administrators—the epileptic suspect, night blindness, and the progress which sulphonamide therapy is yielding in many spheres of treatment.

Nothing could be more satisfactory than the excellent clinical notes and [illegible] at present being submitted to the Editors. Their quantity is beginning to vie with their high quality. There is considerable difficulty nowadays in obtaining accurate information for the section on News of the Service and for obvious reasons much of this must be deferred.

In conclusion we would express our appreciation of the ready help we have received from our contributors, reviewers, correspondents and personal friends. We are resolved come what may to keep the Journal in being and to ensure that it maintains throughout the war its normal peacetime function of disseminating all that is relevant and up to date in Naval medicine.

# Articles.

## MASS MINIATURE PHOTORADIOGRAPHY IN THE ROYAL NAVY

By Surgeon Commander W. C. C. FITZPATRICK,
*Royal Navy Specialist in Radiology, R.N. Barracks, Chatham.*

The incidence of pulmonary tuberculosis in the Royal Navy is relatively high and in spite of all efforts to prevent it and the great improvements in the environment and food of naval ratings which have taken place in recent times this incidence has shown no significant change for more than thirty years. All cases of tuberculosis of the lungs are invalided out of the Navy and the invaliding rate for pulmonary tuberculosis is higher than that for any other disability. The rate has remained approximately 2 per 1,000 per annum since 1906, in which year it was 2.0, while in 1936 (the last year for which statistics were available) it was 2.1 per 1,000 total force.

It has long been known that an X-ray examination will often detect tuberculosis of the lung long before the disease is discoverable by clinical means and before the lesions become "open" and infectious, but it would appear that in order to effect any significant reduction in the amount of pulmonary tuberculosis in the Navy tens of thousands of X-ray examinations would have to be undertaken at frequent intervals.

An investigation which was carried out on some batches of naval recruits who were examined by ordinary X-ray technique at six-monthly intervals for two to three years after entry indicated that very few men are entered into the Navy with active tuberculosis and therefore the vast majority of tuberculous infections must be contracted after entering the Navy. The high morbidity of pulmonary tuberculosis in sailors is doubtless the direct result of that crowded community life which is inseparable from a warship's environment.

Most cases of pulmonary tuberculosis are found to be at a well-advanced stage on their discovery. Nearly all are "sputum positive." Many of these patients must have been disseminating tubercle bacilli to their messmates for months or years prior to their admission to hospital. For these reasons therefore little reduction in the morbidity of tuberculosis could be expected by merely eliminating those recruits who were found to be tuberculous at the time of entry, and no scheme of mass X-ray examinations which did not ensure that all the men in the Navy were examined by X-rays periodically could be expected to succeed in reducing the amount of tuberculosis to a significant degree. The cost, time and organization of such an extensive scheme using ordinary radiographic technique presented almost insuperable difficulties, and did not seem practicable under naval conditions. A full appreciation of the tuberculosis problem as it affects the Royal Navy, and the difficulties in devising an efficient method of using ordinary radiographic methods as an aid to the control of pulmonary tuberculosis in the Royal Navy has been given elsewhere (C. Andrews: *Journal of the Royal Naval Medical Service*, 1938, xxiv, 16).

In March 1939, however, reference to mass miniature photoradiography of the chest in the literature (e.g. Janker, Dormer & Collender, P. H.: *British Medical Journal*, 1/40; *Lancet*, 1939, i, 1026 and 1309) made it advisable to investigate the application of this method to the examination of naval ratings.

Dormer and Collender in Africa, Janker in Germany, and Philips Metallix Co. at Eindhoven have all examined very large numbers of the population by means of photoradiography (photography of the screen image of the heart and lungs—using 35 mm. film in conjunction with a very fast lens). All these workers have agreed that the method is satisfactory, and that its adoption is a triumph in the process of examination of large numbers of people. Messrs. Philips Metallix at Eindhoven examined 100,000 of their work-people (although it is understood that a certain proportion of these were examined by means of fluoroscopy alone) by this method, and as a result they have been able to weed out the majority of infected persons from their factories with a consequent marked improvement in the annual sick list of their workers.

In conjunction with Messrs. Stanley Cox Ltd., 11 Gerrard Street, London, a series of tests was carried out at the Royal Naval Hospital, Chatham, in July 1939, making use of an experimental model prepared by Messrs. Stanley Cox, and the existing X-ray installation. This installation consists of a 4-valve rectified unit built by Dean and supplied in 1931. Two tubes (one tubular and the other a mercodal 6 kW, made by Cuthbert Andrews) were used during these tests. A Leica camera with Dallmeyer f 1.9 lens loaded with Röntgen Fluorapid Film (35 mm.) made by Agfa was arranged 36 in. in front of a Levy West fluorescent screen, so that the chest image produced upon this screen by the X-ray tube 36 in. away could be photographed, the supply to the installation being 220 D.C., making use of a rotary converter.

72 men of average build were examined in forty minutes. Exposure time 0.5 sec., 50 ma. at 60 kVp. was used.

The film was processed in a Leica Daylight developing box. Absolute darkness was maintained during loading of camera and again whilst loading or winding exposed film upon spool of developing box. Kodak Rapid X-ray

Kodak [illegible] (... developer) was used. [illegible] films were slightly [illegible] but the details of lung markings [illegible] appeared to be fairly [illegible] the curving [illegible]. The negatives were projected [illegible] white paper [illegible] 10 [illegible] means [illegible] + 5 lens.

In sub[illegible] Kodak Panchromatic Super XX [illegible] and [illegible] although it is [illegible] one which [illegible]. Messrs Kodak accordingly [illegible] and produced a faster [illegible] experimental and the [illegible] this experimental [illegible] have been tried in the department at Chatham and have been [illegible] graphy. [illegible] ing the [illegible]. This [illegible] naturally [illegible] in any period [illegible]

The [illegible] scheme [illegible] Ma[illegible] 19[illegible] Mr Cox [illegible] photographic [illegible] the potential [illegible]

(a) X [illegible] These [illegible] [illegible]

(b) The [illegible] fluorescent [illegible] lens [illegible] is mounted [illegible] relay operated through [illegible] the under surface of the tunnel [illegible] the insertion of a card stamped [illegible] the number in region of patient's [illegible] request of the Medical Department.

(c) X-ray unit [illegible] single [illegible] with output of 100 m[illegible] transformer [illegible] and valve filament transformers [illegible] tank [illegible]

(d) The control table [illegible] Ballistic [illegible] filament voltmeter [illegible] filament [illegible] kV [illegible] and synchronous motor timer with [illegible] electrical camera.

(e) 10 kW [illegible] cable.

Owing to lack of [illegible] near the present Medical Inspection Room, a specially constructed [illegible] single storey building, was erected [illegible] ing doors. This situation permits the [illegible] department (under cover) as soon as they have [illegible] the M.I.R. through one door and out through [illegible] rooms, thus obviating the provision of extra [illegible] breaking up the examination in the photo- [illegible]

[illegible] A.C. (3-phase) [illegible] a static balancer installed [illegible]

[illegible] the Photofluorographic Department is sub- [illegible]

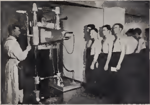
*Reception* [illegible] and with nude counter. Ratings enter [illegible] and pass straight to this counter [illegible] card (already stamped with an [illegible] particulars: Name, Age, Rating, Official Number, Weight [illegible] Number. The latter is essential as it is often the [illegible] means of [illegible] the examination within the [illegible] days. The [illegible] by a Sick Berth rating and the man (with card) [illegible]

*Main Studio.*—The Photographic [illegible] arranged that ingress and egress are unimpeded. The man passes in to [illegible] the screen and the examination is carried out. He then passes out through the door into the dressing rooms. Filing cabinets in the main studio contain all records of examination.

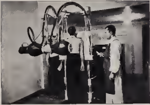
*Medical Officer's Room.*—This is the [illegible] for viewing and reporting. It has all the necessary electric points for viewing boxes and projector.

*Darkroom.*—Must be absolutely lightproof. The loading of daylight developing tanks requires the provision of a rather high working bench. The one fitted here is 46 in. high and measures 20 by 49 in. The high bench prevents fatigue as result of stooping. A shelf 7 in. wide and 6 ft. above the ground runs along two sides of the darkroom. Hooks to hold 5 ft. lengths of film are inserted into the edge of the shelf. This "[illegible]" prevents unnecessary apparatus being stored in the darkroom. The usual darkroom lighting has been installed. As many radiographs are developed in this darkroom a thermostatic tank has been supplied. A [illegible] cupboard for the reception of exposed or unexposed films is fitted above the bench. A Ronco cabinet in one corner is used as a store for films and cassettes, &c.

*Technique.*—Film is received in daylight loading cassette usually. If longer lengths of film are received, they can be cut into smaller strips and loaded into the cassettes in the darkroom without any difficulty. The daylight cassette is placed in the camera, and free end of film threaded on to the receiving drum until it is firmly held. Two quick exposures are made as soon as the camera has been closed in order to place a fresh unexposed frame in position. The set is then arranged so as to give 100 mA at 75 kVp



[illegible]



[illegible] showing the [illegible]

The [illegible] (shirts, etc.) [illegible] They fill in the [illegible] which [illegible] [illegible] the patient [illegible]

[illegible]

[illegible]

[illegible] exposure [illegible] position [illegible] — [illegible] from the side, but with limb rotated [illegible] and [illegible] seconds. The film is placed [illegible] centred—the patient [illegible] told [illegible] hold it and keep perfectly still. The exposure [illegible]

[illegible] The card is placed in a basket beside [illegible]

[illegible]

[illegible]

[illegible]

the apices will be hidden and diaphragmatic movement restricted. In fact the patient will not have taken a deep breath at all!

The X-ray switch is closed when the chest is in full inspiration. When the screen image has faded the stamped card in the tunnel is illuminated and thus the serial number is recorded upon the appropriate frame. The exposed frame then automatically moves on and the camera is ready for the next man. The serial card is removed from the tunnel and dropped into a basket near the apparatus.

As soon as the whole of the film has been exposed a warning light upon the control table glows and there is a buzzing noise in the camera. The film is then rewound by means of a small handle upon the under aspect of the camera. The cassette which now contains an exposed film is then removed from the camera and a fresh spool inserted. Two blank exposures are made and the apparatus is again ready for use. The whole proceeding taking about ten minutes.

The numbered cards in the basket which refer to frames upon the exposed film just removed are taken from the basket, secured by means of a rubber band and put on one side. The appropriate record cards are made out subsequently, i.e. when the examinations for the day have been completed.

The exposed film is immediately processed. This ensures that all films taken during the session will be available for projection the same day. This is essential during the present time when men may be drafted away the following day.

With the present camera about 250 men can be photographed each hour. An improved camera capable of holding 100 ft. lengths of film with guillotine and detachable container—to be available in a short time—will permit this number to be increased to about 300 per hour. When patients can be instructed as to what is required of them beforehand this number will be still further increased. A "dummy" model of the apparatus—placed in the waiting room—would be useful for instruction purposes.

*Processing of Film.*—Kodak Super XX, Ilford HP2 and Kodak Special experimental emulsion coated films have been used. These films are panchromatic and must therefore be processed in absolute darkness. The Kodak Special film is apparently the fastest film obtainable and the grain is not noticeable upon projection to the requisite size. It is twice as fast as the Super XX film. It is therefore preferred.

Kodak D19b, Kodak D76d (fine grain) and Johnson's X-ray developer were all used at different times. There is no appreciable advantage in using a fine grain formula whilst there is the disadvantage of increased developmental time. Twelve minutes in Kodak D19b or Johnson's X-ray developer gave quite satisfactory results at temperature of 65° F.

Experimental work has shown that the amount of sharpness gained by using a fine grain formula is not sufficient to justify the reduction in apparent speed caused by the use of fine grain developers. Development in D 19b for eight minutes gives considerably more speed than twenty minutes in D 76. Increasing the time of development in D 19b gives a useful increase in speed with little increase in fog. Upon the basis of these tests Messrs. Kodak recommend development for twelve minutes at 65° F. in D-19b in order to obtain the maximum speed and contrast either from Super XX or the experimental film.

Regarding the number of 1.60 metres spools which can be processed in a given quantity of developer, it has been noted that eight spools have been developed without any appreciable fault. There is a replenisher on the market which should allow of a much longer life of the developing fluid.

The Kodak plastic roll film tank, the Leitz roll film tank, the Correx daylight developing tank have all been used in this department. In all of these the film must be wound upon the reel or spool in absolute darkness, placed in the tank and covered with the light proof cover. The remainder of the procedure can then be carried out in the daylight or artificial light. The developer is poured into the tank through the light proof hole in the cover at temperature of 65° F. and is allowed to act for twelve minutes. The tank should be rotated and agitated for ten seconds every two minutes throughout this period. An alarm clock should be used as a control. Upon expiration of twelve minutes the fluid is poured out through the hole into another receptacle and ten changes of water substituted in order that film may be well washed. The water in its turn is poured out and the tank filled with an acid fixing solution and this is allowed to act for twenty-five minutes. It is advisable to continue the agitation during fixation.

After fixation the film is removed from the small tank and a clip attached to each end and the film washed in a large tank of running water for one hour. It is then removed and hung up to dry in a dust free atmosphere. The clips remain in situ until the film is quite dry in order to prevent curling. The excess moisture is removed from the surface by passing the film between two moist cotton wool pads. The film can be dried in a dust free drying cabinet, the one in use here being a converted Roneo cabinet [illegible] by 2 by 1½ ft. The shelves have been removed, cross wires attached above and a 100 watt lamp fixed in the base.

The following points were noted with regard to the developing tanks mentioned above:—

*Kodak.*—Very careful threading of film from the centre to periphery of the spool is required and if this procedure is not carried out by an experienced worker the film is liable to make contact with itself, the developer fails to act at the [illegible] We have [illegible] is to d[illegible] from the periph[illegible] contact.

*Feit* [illegible] the film [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] smaller strips [illegible] letter file. These [illegible] each strip. Th[illegible] not require very [illegible] passes through the projector. Keeping [illegible] in the hospital. The filing of these [illegible] upon the staff employed. [illegible] and expected within a very short period [illegible]

[illegible] during the department is [illegible] alphabetical and in numerical order [illegible] upon the film of his chest is already [illegible]. If further investigation is required the same [illegible] patient. Both cards have a [illegible] report made after reading of film [illegible] for reference purposes.

When a man is discharged to hospital [illegible] which he has been posted the slightly enlarged [illegible] together with any film which may have been copied [illegible] hospital. The hospital records are entered upon the [illegible] medical [illegible] the hospital [illegible]. Upon the patient's return to the depot the card duly completed is filed.

All men joining the Navy in this depot [illegible] from ships or other establishments since the [illegible] examined by the [illegible] whenever possible.

*Recording.* Normally [illegible] upon the [illegible] cards and then [illegible] numerical [illegible]. [illegible] expect in all doubtful cases and more than [illegible] to the Sick Quarters for hospital investigation [illegible] been discussed in connexion with report upon film.

(*a*) Spoiled or unsatisfactory films. Small metal tab placed on top left corner of both cards. The examination is repeated [illegible] possible—using the original serial number. If there [illegible] a new number is allocated and stamped upon both [illegible] cards.

(*b*) Patients requiring further examination [illegible] placed on top right corner of cards. Appropriate [illegible]. The tab remains in situ until 12 by 15 film has been reported upon. If N.A.D. it is then removed.

(*c*) Doubtful or cases in which a lesion is [illegible]. If possible Medical History Sheets of all ratings passing through the department are stamped and findings noted (date and serial number, &c.).

*Ratings Sent to Hospital for Investigation.* Ratings referred by the P.M.O. are stripped draft and discharged to hospital for observation and a thorough investigation. A special ward containing thirty beds and under the charge of a medical officer who has specialized in chest conditions has been set with in these cases. They are usually retained in hospital for about one week. During this period a record of the pulse and temperature is kept, blood sedimentation tests, sputum examinations and further radiological examinations, &c., are carried out. Upon completion of these investigations they may be returned to duty, but in category B or C (fit for duty in ship with a medical officer, or fit for duty in shore establishments only), or surveyed and invalided from H.M. Service.

*Men Drafted Away before Findings can be Confirmed.*—When drafting is rather rushed and a man leaves depot before a further examination can be made, a reference sheet is forwarded to the Medical Officer at his destination asking that he be X-rayed as convenient, and that a copy of the report may be forwarded to this department for record purposes.

*Staff.*—1 Radiologist, 4 Radiographers, 3 others (1 Typist).

The above staff can deal with between 1,500 and 1,800 per day. A typist is essential. The radiographers carry out in addition any routine X-ray examinations as required. In this establishment there is a service afloat unit used for minor injuries which may arise in the barracks. Thus the necessity of sending these cases to the X-ray department at R.N. Hospital is obviated. The films are developed in the Photoradiographic Department dark room.

The radiographers share the actual photography and darkroom work. They should undergo a short course of instruction in the technique of loading and processing of 35 mm. film. This course would normally last fourteen days and would include demonstrations in the recording and filing processes. This will ensure a standard system throughout the Service.

A typist is essential. The record cards must be kept up to date (entries regarding disposal, reports of subsequent examinations, &c., made) and carefully checked. The report and film of every man must be readily accessible whenever required.

The remaining ratings need not be qualified as radiographers, but those with experience of office routine should be selected whenever possible. They will be required for completing records, &c.

All the men employed in the department should be junior, so that they may remain in the department as long as possible. The staff of any department must receive efficient training. They should work for some time in a unit which is already functioning and which has a *trained* staff. By this period of training only will they avoid the many errors which can and do arise. The technique of positioning, estimating the necessary exposure for various patients, loading developing reels, and satisfactory processing of small film are instanced. Experience in these points is essential if satisfactory negatives are to be obtained in every case. It is most annoying to [illegible] frames followed by one [illegible] have been spoiled [illegible] by fogging in dark room [illegible] development through faulty [illegible] by scratching during drying. Dust [illegible] during drying.

The staff for this type of work must be specially selected. They must be methodical and hard-working. They should be keen upon photography but must realize that they are taking up a very specialized subject. They should be healthy and [illegible] as much time as possible in the fresh air during their off-duty periods.

The radiologist will require some experience in accustoming himself to the smaller film. The reduced size [illegible] lends an apparent enlargement [illegible] cardiac shadow. The [illegible] well defined and therefore lesions here are easily detected. The [illegible] blood vessels (markings) especially upon the right [illegible] the hilar structures. An apparent enlargement of the hilar [illegible] many cases.

During one period when the apparatus was not functioning, owing to lighting out of order, the opportunity was taken to [illegible] all the films exposed since the inception of the scheme. It was found that with increased experience in reading [illegible] the number of cases requiring normal radiographs [illegible] Cases previously thought to have doubtful lesions [illegible] were then considered to be free.

*Prints of Suspicious Films.*—Small slightly enlarged prints (2 [illegible] by 3 [illegible]) are made of all suspicious frames. These prints are then pasted upon the alphabetical index card. Copies can also be forwarded to the medical officer of the rating's ship if he has been drafted away before content 12 by 15 film has been exposed. If required, contact strips can be made in cases where the original strip is required for projection elsewhere.

*General Remarks.* The apparatus was installed at the end of June 1940. Minor alterations and defects associated with the "Blitzkrieg" activities in London caused some interference, and therefore the unit has not been in steady operation all the time. A large number of men have been examined and the results have demonstrated the extreme value of these investigations. During the period under review 8,493 men have been examined. 229 or 2.7 per cent. of these were found to have suspicious chest films (35 mm. ciné film). Steps were taken to take further chest films of most of these cases—although the drafting situation at the time rendered this impossible in a large number of cases. 52 men were discharged to hospital in view of the suspicious findings (this figure included cardiac and other lesions as well as purely pulmonary cases). 40 of the hospital cases were those with a pulmonary lesion and of them 47.5 per cent. were found to have sufficient evidence of disease case then being invalided from the Service [illegible] enough to warrant [illegible] under [illegible] periods.

In a large number [illegible] felt quite well, and [illegible] time of the investigation.

The routine examination [illegible] radiography is the cheapest and [illegible] carriers of pulmonary [illegible]

Men who have had [illegible] method been picked [illegible] tuberculosis, (b) closed [illegible] diverse conditions [illegible] (e) bronchiectasis, (f) cardiac [illegible]

Men found to be unfit [illegible] Service and thereby [illegible] or their messmates. The employment [illegible] regulated [illegible]

Cases with apparent [illegible] enlargement [illegible] other than [illegible] mality are immediately [illegible] note the ordinary [illegible] INVALIDED in this investigation all passed through [illegible] the majority of cases through the medium [illegible] suspected of any lesion.

In addition to the weeding out of personnel [illegible] attention, a permanent record of the chest appearances [illegible] of the question of subsequent disability claims [illegible] will be invaluable during the process of demobilization upon the [illegible] of hostilities.

## SUGGESTED SCHEME FOR EXAMINATION IN THE ROYAL NAVY

### (a) *In Peace Time*

*Men Drafted.*—Screening examination a few days before proceeding upon draft leave, prior to draft. Film can be read and draft stopped if necessary. The suspected rating can be radiographed and subsequent disposal arranged. Relief can be told off for draft. Men serving in shore establishments should be examined every two years. Men returning from foreign service will be examined on passing through their home depot. The medical history sheets of all men examined should be stamped with date of examination, serial number and findings.

*Men Joining.*—Apparatus should be available in all Naval Barracks and

[illegible]

### [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

### [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Every [illegible] inspection [illegible] photographic examination [illegible] and [illegible] are then negative [illegible] symptoms [illegible] he returns to duty [illegible] of the [illegible] of [illegible] transferred to the Royal Naval Hospital Sick Quarters and [illegible] thorough examination is carried out as described on page 10.

In addition to the [illegible] already [illegible] ships [illegible] have been photographed [illegible] copies of the reports made have [illegible]. It must be understood that the follow-up [illegible] is very much more difficult in the Royal Navy [illegible] rapid shifting of men [illegible] difficulties [illegible] ships have rendered it almost impossible [illegible] the after-history of the 229 cases picked up.

In view of the number of positive [illegible] on in the Royal Naval Hospital, it is almost certain [illegible] proportion of the remainder of the suspected cases have already [illegible] and disposed of in other districts.

Acknowledgment is due to Surgeon [illegible] D. H. [illegible] R.N.V.R. who had the care of cases admitted to hospital.

## APPENDIX

In a given quantity of developer it has been [illegible] spools have been developed without any appreciable [illegible].

There is a replenisher on the market which [illegible] much longer life of the developing fluid.

It must be understood that these figures are largely speculative so far as they apply to Fluordak; they are, however, likely to err on the safe side.

[illegible]

| Metric | | Avoirdupois |
|---|---|---|
| 1·0 | gm. elon | 140 gr. |
| 144 | gm. sodium sulphite (crystals) | 11 oz. 210 gr. |
| 72 | gm. [illegible] | [illegible] oz. 390 gr. |
| 16 | gm. hydroquinone | 1 oz. [illegible] gr. |
| 180 | gm. sodium [illegible] (crystals) | 10 oz. 17 gr. |
| 48 | gm. [illegible] | 1 oz. [illegible] gr. |
| [illegible] | gm. [illegible] | [illegible] gr. |
| 1000 | water to make | 80 oz. |

Dissolve the chemicals in the order given in warm (not boiling) water taking care that each is dissolved before the next is added. Use only stone

[illegible]

[illegible]

[illegible]

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## WAR BURNS AND THEIR TREATMENT

By [illegible] Surgeon Rear-Admiral CECIL P. G. WAKELEY, F.R.C.S. [illegible]

*[illegible] Surgeon to the Royal Navy, Royal Naval Hospital [illegible] King's College Hospital*

[illegible] years have passed since [illegible] Royal Naval Medical Service, and [illegible] (1) War [illegible] (2) [illegible] of the extremities.

[illegible] in the Royal Navy [illegible]

[illegible] Chemical [illegible] present [illegible]

[illegible] the treatment of burns [illegible]

[illegible] knowledge [illegible] experience [illegible]

[illegible]

*Prevention.*—[illegible] exposed parts of the body [illegible] to be protected by [illegible] gun turrets [illegible]

[illegible] parts of the ship. [illegible] saved many [illegible] hands. [illegible] manding officers were [illegible] the use of anti-flash gear the number of burn cases would be [illegible] and they would cease to be a problem and a menace. [illegible] many good petty officers and ratings are invalided [illegible] owing to scarring of the face and hands. Prevention [illegible] in cure.

*Pathology of Burns.*—[illegible] and scientific treatment for burns unless the [illegible] is fully understood, and since the Great War [illegible] of the subject has been forthcoming. Quite [illegible] been obtained from complete post-mortem examinations [illegible] and it should be impressed on medical officers in the Service that [illegible] examinations are important if progress is to be made in the future. [illegible] are not useless and [illegible] examination [illegible] consider them. In [illegible] treatment can be instituted and a fatal [illegible] known and accepted [illegible] of death in the [illegible] findings.

(1) Primary Shock. [illegible] of the accident or [illegible] resemble [illegible]. The pulse is feeble, [illegible] fall, and the [illegible] clammy. Fear often [illegible] shock, and the patient [illegible] expression. The pro[illegible] is small, as the condition [illegible] the relief of pain by morphia. The condition must be treated [illegible] apparently slight because [illegible] high mortality. Primary shock depends [illegible] rather than the depth and [illegible] 75 per cent. [illegible] surface is involved may [illegible] have been treated in Naval Hospital [illegible] than this were not dead and [illegible].

(2) Secondary Shock. [illegible] collapse which appears [illegible] burn. It is a most serious condition and [illegible] deaths in burn cases. There [illegible] of the initial shock and the development of the [illegible] condition simply merges [illegible] symptoms of thirst and [illegible] falls, the pulse is feeble, the respiration [illegible] and the temperature is subnormal. Probably the [illegible] in the causation of secondary shock [illegible] muscle tissue spaces

[illegible] protein is [illegible] small compared to that which [illegible] because the fluid [illegible] replacing the [illegible] the plasma [illegible] [illegible] [illegible] experiment. [illegible]

[illegible] of toxins. [illegible] the human [illegible]

(c) Septic Intoxication. [illegible]

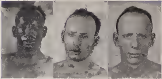
(d) Complications. [illegible] haemorrhage [illegible]

Multiple [illegible] and [illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible] These drinks [illegible] which [illegible]

[illegible] removed [illegible] undertaken [illegible] around the [illegible] the [illegible] before [illegible] away [illegible] and then sprayed [illegible]

[illegible] in electric [illegible] and the saline [illegible] device. These [illegible] nly fitted [illegible] to save the lif[illegible] extensive burns. The [illegible] in the saline bath [illegible] and the body [illegible] product [illegible] patients can tolerate long [illegible] in the bath and [illegible] increased each day. When [illegible] the bath [illegible] thick saturated saline pack [illegible] the Hey Groves model. Such [illegible] over to have his saline pack [illegible] three days treatment in the bath [illegible] burns treated as described [illegible] grafting should be performed [illegible] will always result.

An alternative method of [illegible] remove the first aid dressing [illegible] saline. On no account should [illegible] with 1 per cent. aqueous gentian [illegible] electric hair drier [illegible] and the [illegible] with the [illegible] cent. silver nitrate is [illegible] application of both [illegible] is produced which [illegible] cracks should be treated [illegible] has a great tendency [illegible] never be used on the hand [illegible] phalanges may result [illegible]

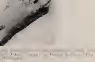


FIG. 3. Ext[illegible]
[illegible]
published by E. & S. [illegible]

[illegible]

[illegible]

[illegible] and presented.

[illegible]

[illegible]

[illegible] epidermis. There is also an elongation of the basal cells of the Malpighian layer. Cases have occurred where [illegible] the skin [illegible] been the only means of establishing the cause of death [illegible] applying triple dye to the burn [illegible].

[illegible] is the typical injury [illegible] described [illegible]. The skin lesion is similar in type to the electrical mark [illegible] resulting from the discharge [illegible] greater [illegible] [illegible] may not be complicated by superficial burning [illegible] local necrosis resembles a burn and may lead to deep [illegible] to deep charring of muscles and bone [illegible] than the current [illegible] and may occur on the [illegible]. When such an injury is uncomplicated by burning the [illegible] those of the electric mark. It is painless and [illegible] inflammatory reaction is absent; the necrotic [illegible]. There is no redness and suppuration [illegible] signs. Such [illegible] necrosis has [illegible] and depth for the first two or three weeks [illegible]. The third week is the danger period when [illegible] degenerative changes in the arteries [illegible] phase of painful healing, [illegible] ensues and [illegible] results. There is no tendency to [illegible]. When, however, superficial burning complicates the electrical [illegible] of an ordinary burn. The injured [illegible] the usual red area of reaction around the [illegible] all the usual [illegible]. The treatment [illegible] prevent gangrene [illegible].

[illegible] usually the electrical necrosis affecting [illegible] is to result in gangrene of the affected part [illegible] superven[illegible] in nine days or several weeks after the [illegible]. Cases have been reported where a dry gangrene [illegible] immediately after the accident. No [illegible] of this type of occurrence has so far been advanced. [illegible] of electrical injuries include —

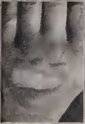
*[illegible]*. This may be defined as an impregnation of [illegible] metal occurring when the metal is molten in an [illegible] the epidermis. The affected skin [illegible] particles of metal and the decolorized area cannot [illegible]. The skin feels dry and is restored to its normal [illegible] of the epidermis. The finger nails when metallized [illegible] to normal only by the growing away of the decolorized area. [illegible] accidents [illegible] high temperature the clinical picture

[illegible]

[illegible]

[illegible]

[illegible] the region adjacent to the skin lesion [illegible] large and superficial [illegible] the body. Occasionally [illegible] is the only manifestation of the [illegible] [illegible] symptomless and invariably disappears in a few days. [illegible] changes in the blood vessels [illegible] believed to be the [illegible] If the electrical burn is [illegible] followed by [illegible]



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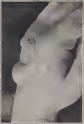

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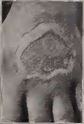

3

[illegible] follow [illegible] proper [illegible]

[illegible] the Royal Navy [illegible]

[illegible] W. H. [illegible] R. P. [illegible]

REFERENCE

[illegible]

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## COCCYGEAL SINUS

By S[illegible] F. [illegible] DURHAM, F.R.C.S., R.N.V.R.

[illegible] Royal Naval [illegible]

[illegible] all it—pilonidal sinus [illegible] and still less often [illegible] cases and even in [illegible] nine cases this year [illegible] First the condition [illegible] and some attention [illegible] of all the English [illegible] paragraph and [illegible] equally scanty.

In [illegible] 1847 and by Warren in 188[illegible] all the textbooks and during [illegible] been collected and reported.

*Clinical* [illegible] small orifice [illegible] More often than [illegible] openings [illegible] exactly in the [illegible] coccygeal point [illegible] of the natal fold. Very occasionally the lowest opening [illegible] an inch from the anus.

The openings are usually round or oval [illegible] and free from granulations. Frequently a small tuft of hair projects from the sinus, and [illegible] hairs. If a [illegible]

Fig. 1.—[illegible]

Fig. 2.—[illegible]

Uninfected sinuses are rarely seen for [illegible] small [illegible] and troublesome symptoms the patient [illegible] of them. Infection once the [illegible] is [illegible] along the line of the sinus perhaps [illegible] and periodically by the development of secondary abscesses. In the [illegible] of inflammation the primary [illegible] blocked up and [illegible] at the blind end of the sinus [illegible] swelling forms. This swelling is usually the size of a [illegible] ping-pong ball. Unlike the primary opening [illegible] one side or the other of the midline. The swelling is [illegible] to the subcutaneous tissues and there is usually [illegible] of inflammation [illegible]. As the inflammation progresses either the [illegible] contents of the [illegible] are discharged through the primary sinus or [illegible] the pus tracks out through the subcutaneous tissues [illegible] through the skin forming a secondary opening.

The secondary openings differ from the primary openings in that they are [illegible] [illegible] ordinary [illegible] [illegible] treated [illegible] [illegible] them [illegible] [illegible] sinus opening [illegible] Nevill noted [illegible] in the [illegible] [illegible] on the [illegible] Tendall and Miles [illegible] people were more [illegible] Actually I found [illegible] all having any [illegible]

[illegible] there is a [illegible] different [illegible] which were [illegible] which 16 [illegible] absent [illegible] lost for years [illegible]

[illegible] the first time between [illegible] been reported starting [illegible] in which the [illegible]

[illegible] might be expected [illegible] but there is little [illegible] of his sons [illegible] reported [illegible] Mehling tells of [illegible] him Breidenbach [illegible] on only 2 of [illegible] but it was [illegible] a girl [illegible] inpatient department [illegible] is necessary [illegible] pinnial [illegible] his sister [illegible] [illegible] her [illegible] surprise [illegible] treatment.

[illegible] raises the tendency to inflammation, but [illegible] Glenn considers that Russian Jews [illegible] 22 in his series of 120 cases —but it must be [illegible] that these people form a large percentage of [illegible] this hospital and [illegible]

All of [illegible] tal with the [illegible] of hair [illegible] only [illegible] I had found the [illegible] before the [illegible] [illegible] Many of [illegible] are [illegible] of these and many [illegible] their darkness [illegible] possibly because their [illegible] their hairs

There is no [illegible] [illegible] [illegible]

*Symptoms*—Most [illegible] sitting down less often of pain [illegible] walking and rarely of pain [illegible] soiling of the clothes by the [illegible] the [illegible] symptoms [illegible] and the discharge [illegible] In [illegible] the consulting surgeon [illegible] until he has been troubled by the condition for [illegible] three years and generally a secondary sinus has already developed [illegible] either spontaneously or following a [illegible]

*Diagnosis*—I have [illegible] the infrequency with which a correct diagnosis is made before the [illegible] is sent to the consultant Of the first 25 cases I saw only [illegible] had been [illegible] diagnosed and 6 out of 9 cases transferred to R N H [illegible] this year arrived with the wrong diagnosis ([illegible] + [illegible] 2) And yet the condition is unmistakable [illegible] It should be suspected in every case of a fistulous opening [illegible] inches behind the anus and close to the mid line [illegible] between the most anterior sinus and the anus [illegible] the rectum or anus and the fact that a [illegible] the sinus runs backwards towards the sacrum and not forwards [illegible] will distinguish between it and a fistula in ano The absence of any X ray evidence of involvement of bone and the fact that no bare bone can be felt on probing the sinus will differentiate a coccygeal sinus from necrosis of the sacrum or coccyx The discharge from the sinus is generally much more profuse and foul smelling than the discharge from other forms of sinus in this region

*Pathology*—The primary sinus is lined by many layers of stratified epithelium which show only slight cornification of the layers next the lumen Imperfect and rudimentary papillæ may be seen in places as well as hair follicles and sweat glands In the earlier stages the lumen usually contains quite [illegible] prolonged suppuration [illegible] changed [illegible] this [illegible] by granulation [illegible] healed off from [illegible] and are always [illegible]

*Pathogenesis.*—[illegible] but it is generally agreed that they are the result of [illegible] in embryonic development. Warren considered the [illegible] hair follicle which grew inwards and—as he [illegible] after it. Goodsall and Miles thought that the condition [illegible] during a hæmatoma which then became infected [illegible] The histology of the sinus provides ample proof of the incorrectness of [illegible] theory. Many believe it to be a vestigial remnant of the spinal cord but they fail to explain the notable absence of neural tissue and the transition from squamous to [illegible] epithelium. It cannot be a teratoma for only hair and squamous epithelium of the possible teratoid structures are found in its walls, the structures present are fully differentiated and no malignant changes have been reported. Bland Sutton and many others look on it as a true sequestration dermoid due to faulty coalescence in the mid-line. Stone has recently pointed out that in many birds there is a preen gland lying in the fat over the [illegible] and that this gland empties into a skin-lined duct opening on the back and then continuing [illegible] small tuft of feathers. The analogy is very suggestive, but I fear the more prosaic theory that the sinus is the remnant of the caudal ligament on the median raphe is probably the correct one. In early infancy the sinus is no more than a dimple, but as the child grows up and the subcutaneous tissues thicken, the sinus is drawn out and becomes correspondingly narrower. The accumulation of secretion and dirt in the sinus results in infection, abscess formation and the development of secondary sinuses.

*Treatment.*—Naturally the aim of treatment is to secure a permanent cure and also to minimize as far as possible the period in hospital. The high percentages of recurrence and the failure to secure prompt healing which have been recorded in previous papers has resulted in the publication of a great number of suggested modifications in treatment, and my only excuse for adding to the list is that the method that I shall describe has had much better fortune than those of others.

It is now recognized by all who have any experience of the condition that the only reliable treatment is complete excision of the whole area involved. It is at best a waste of time to try and cure these sinuses by chemical means, electrotherapy or by simple incision. Isolated cures following these forms of treatment have been reported but they are so few, the treatment so prolonged and the evidence of cure so slight that they must be considered simply as freaks.

[illegible] should not be attempted [illegible] inflammation of the [illegible] by routine incision and [illegible]. I have done this on only five [illegible] had always waited until the sinus was in a [illegible].

Some surgeons are in favour of a preliminary [illegible] sinus after the injection of lipiodol and many [illegible] inject it with melted paraffin wax or methylene [illegible]. The [illegible] obtained by these procedures are however quite [illegible]. In the first place I consider that success can only [illegible] is planned on so wide a scale that there can be no [illegible] part of the sinus being left behind. Secondly I feel th[illegible] when the patient is on the operating table would tend to [illegible] which is so necessary if primary union is to be obtained. [illegible] examination of the sinus after injection shows that in places [illegible] forced out of the sinus into the surrounding normal tiss[illegible] places has failed to reach all the ramifications of the sinus. [illegible] statistics reported by various surgeons shows that th[illegible] experience and those who have obtained the highest perc[illegible] union advise against any form of injection.

It would appear from the literature that primary union [illegible]. Romanis and Mitchiner in their Text Book of Surgery say that the wound must be allowed to granulate, as healing by first intention cannot be expected, and this dictum has been endorsed by almost all other surgeons. Newell and Gabriel advocate an attempt at primary union but their published statistics show that in a considerable percentage of their cases they failed to attain this ideal. Surgeons in America would not appear to have been more successful (Table I). If primary union is obtained the patient can be up and about in about 14 days, but if healing occurs by granulation convalescence is very prolonged. In my own experience patients healing by granulation have been from 7 to 16 weeks in doing so. Newell found that his patients took about 10 weeks, and American writers record similar experiences. In view of the disappointing results attempts have been made to hasten healing by secondary suture but without success.

I have attempted primary suture in 75 consecutive cases. 72 of these cases healed by first intention. In Case 50 haemostasis was obtained with diathermy, and this I think was the cause of failure. Case 59, a very fat youth, broke down at the upper end of the wound and took five weeks to heal. The third failure was the last case in the series, and in it I omitted the usual swabbing out of the cavity with flavine.

*Pre operative Treatment*.—Two nights before operation the patient is given [illegible] the next [illegible] etc. [illegible] the [illegible] that local infiltration [illegible] When the [illegible] on the table [illegible] just outside [illegible] of the [illegible]

*Operation.* An elliptical [illegible] opening [illegible] While [illegible] should be [illegible] and dead space. [illegible] opening it is sufficient to remove a strip of skin [illegible] numerous secondary openings [illegible] them. [illegible] the most primary opening [illegible] when there [illegible] should pass at least [illegible]

[illegible] is then deepened [illegible] over the sacrum and [illegible] over the coccyx. The [illegible] the whole area is excised [illegible] to the ligaments over the sacrum and coccyx [illegible] of the gluteal muscles.

Primary union can only be obtained by (1) Complete excision of the sinus. (2) Asepsis or at least adequate antisepsis. (3) prevention of post-operative infection of the wound from the anus. (4) perfect haemostasis. (5) obliteration of the cavity left after excision. (6) the avoidance of buried sutures or ligatures. (7) the use of an eversion suture which will prevent the marked tendency of the skin edges in this region to turn in.

Even with the best technique the presence of the discharging sinus makes complete asepsis uncertain, and it is my custom to swab out the cavity with flavine (1:1000). Infection from the anus is prevented by the pre-operative treatment, by covering the anus with a swab soaked in antiseptic during the operation and during convalescence, and by keeping the bowels closed for seven or more days after operation.

[illegible] considerable oozing hæmorrhage [illegible] from the surface of [illegible] over the sacrum and coccyx. [illegible] rolled [illegible] and the [illegible]. The [illegible] or any other foreign body left in the [illegible] the chance of primary union. With patience it is [illegible] possible to obtain [illegible] hæmostasis without the use of any ligatures. [illegible] not more than [illegible] a dozen in 74 incisions. [illegible] ligature [illegible] it be of the finest plain catgut.

Obliteration of the cavity [illegible] most important step in the operation. [illegible] for suturing the deep tissues has been [illegible]. [illegible] which has been successful in [illegible] (figs 3 and 4). The [illegible]

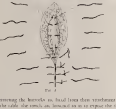
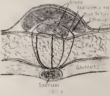


Fig. 3

[illegible] strips retracting the buttocks are freed from their attachment to the underside of the table, the towels are loosened so as to expose the skin for two inches round the edges of the wound, and this exposed area is swabbed over with dettol. Strong silkworm sutures are then inserted, entering the skin at least 1½ in. from the edge of the wound and embracing the whole thickness of the tissues down to the level of the floor of the cavity. A bite is taken of the ligaments over the sacrum, and the suture is carried out through the tissues on the other side. These sutures are inserted ½ to ¾ in. apart, and are left untied until later in the operation.

A series of eversion sutures is now inserted about ⅓ in. apart (figs 3 and 4). These sutures also take a bite of the ligaments in the floor of the cavity and for the present are left untied. The insertion of the sutures usually causes some [illegible] and this must now be checked by pressure with hot packs. Once [illegible] is swabbed out with [illegible] and then the incision [illegible], starting at the ends of the wound and working towards the centre. [illegible] swabbed over with [illegible] and a thick roll of gauze [illegible] and over it the deep sutures are tied. A pad of [illegible] with the gauze roll and the dressing is fixed on with [illegible] elastoplast. Another pad of wool is applied [illegible].



[illegible]

*After-treatment.*—When the patient is returned to his bed he is placed on his back and the pressure helps to obliterate the dead space in the wound. After he has fully recovered from the anaesthetic the patient may find it too painful to keep lying on his back; if so he can lie on his side or face. The bowels are kept constipated by giving a low residue diet. On the sixth or seventh day the sutures are cut but not removed, and the dressing is taken off. The wound is swabbed over with alcohol (70%), a new dressing is applied and fixed with elastoplast. The next day half the sutures are removed, and the remainder the day after. The buttocks are kept strapped together for seven to ten days after the sutures have been removed. The patient can get up about the tenth day, but he must be warned against the risk of splitting the wound, and he cannot ride a bicycle with safety for at least two months.

In spite of taking every care it will occasionally happen that the wound becomes infected, and it is then necessary to remove all the sutures immediately and to pack the wound widely open with vaseline gauze. Increasing pain, a rising temperature, signs of [illegible] an increasing leucocytosis

[illegible]

[illegible]

TABLE I

[illegible]

[illegible]

[illegible] 36, 71
[illegible] 206
[illegible] 101, 3
[illegible]
[illegible] 207
[illegible]
[illegible] 54
[illegible] 107
[illegible] 152
[illegible] 21, 19
[illegible] 42
[illegible]
[illegible] 57
[illegible] 31
[illegible] 96
[illegible] Science 28

# GASTROSCOPY

[illegible] EDWARDS M.S. [illegible]

[illegible] King's [illegible]

[illegible] W. H. S[illegible] gastroscope [illegible] investigations in [illegible] St Bartholo[illegible] months was [illegible] University College Hospital, Hancocks [illegible] Liverpool [illegible] succession so [illegible] which lack [illegible] undertaking there was some [illegible] in gastroscopy with this new [illegible] investigation of the greatest [illegible]

[illegible] no new thing for its history dates back [illegible] middle [illegible] when Campbell of Glasgow attempted to [illegible] swallow. His attempt failed. "I know [illegible] swallow [illegible] — if I can swallow a trumpet" said the [illegible] tended victim [illegible] later in 1868 Kussmaul succeeded in passing a rigid [illegible] but the primitive means of illumination then available [illegible] for him to get a view of the stomach. [illegible] years later Mikulicz [illegible] attempt. Electricity had now become a practical means of illumination and the Mikulicz gastroscope carried a [illegible] light. The [illegible] claimed to have seen a carcinoma near the [illegible] end of the stomach, truly a great diagnostic achievement in days [illegible] X-ray. But the Mikulicz gastroscope was large and cumber[illegible] too dangerous and uncertain for practical use. In the succeeding [illegible] types of instrument were invented. Nitze and Leiter made [illegible] with terminal vision and in 1899 Rewidzoff designed a gastroscope to the end of which a flexible guide could be attached to facilitate its [illegible] into the stomach. Mr H S Souttar and the late Theodore Thompson designed an instrument which gave a certain measure of success, the [illegible] of which was published in 1909 (*British Medical Journal*, i, 737). In 1911 appeared the Sussmann gastroscope which, although a great advance upon anything hitherto, was still too dangerous. My now retired colleague Arthur Edmunds, who brought a Sussmann gastroscope to King's College Hospital before the 1914 War, came to the conclusion that a laparotomy was a far safer means of diagnosis.[1]

[illegible]

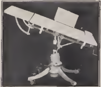
[illegible]

## The [illegible]

[illegible]

## The [illegible]

[illegible]



[illegible]

[illegible] time by the [illegible] difficult [illegible] words in front of [illegible] hand on the [illegible] patient's eyes [illegible] extension [illegible] kept under [illegible] on the [illegible] well with [illegible] is held [illegible] in the patient [illegible] the [illegible] longer [illegible] at the tongue [illegible] possible. The [illegible] the lines [illegible] esophageal [illegible]. A little [illegible] esophageal [illegible] should be [illegible]

All this [illegible] and [illegible] from [illegible] the [illegible] beginner [illegible] in the [illegible]. The [illegible] younger people [illegible] they will [illegible] esophagus [illegible] formed [illegible] the instrument [illegible] —and the [illegible] the patient should [illegible] difficulty [illegible] usually [illegible]. The [illegible] passes the glottis. [illegible] a moment [illegible] him. The affair will [illegible]. If [illegible] left at the level of the esophagus [illegible] the instrument does not pass into the stomach [illegible] attempt. On [illegible] patient must never be subjected to risk.

In the early days there may be many failures. [illegible] his pride and not get disheartened. As time goes on [illegible] the failures will steadily diminish in number [illegible] will perform the examination with the completest [illegible]

As soon as the instrument enters the stomach the [illegible] are attached. A quick glance serves to confirm the [illegible] and the instrument is now quickly and gently pushed [illegible] it will enter without difficulty until [illegible] resistance. Air is gently blown in [illegible] slowly distended until the walls stand out [illegible] well always to switch off the light during the intervals [illegible]

The one disadvantage of the flexible part of the [illegible] control can be exercised over its distal end—although R[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] has parallel [illegible] they disappear [illegible] the atrophy. [illegible] near the objective lens they will [illegible] abnormal [illegible] hypertrophied. This is of course [illegible] illusion. [illegible] should only be diagnosed if they [illegible] If the stomach is over-distended [illegible] and the stomach mucosa may [illegible] before a diagnosis of atrophic gastritis is made. [illegible] visible in the normal stomach except in the [illegible] are readily seen through the very thin mucosa [illegible]

(4) The lie muqueux or [illegible]

[illegible] the patient on the left side. [illegible] rectal [illegible] but the presence in it of blood and mucus will be significant. It is sometimes difficult to be sure whether excess of mucus is due to [illegible] secretion by the gastric mucosa or to swallowing from the respiratory tract. If the former it is usually more tenacious and clings to the surface of the mucosa.

When the instrument is withdrawn it should be rinsed thoroughly with warm water and then wiped in all its parts with 70 per cent alcohol. A little air should be gently blown through it to dispel [illegible] away.

### The Recognition of Diseased States

*Gastritis.*—Three types may be recognized—Catarrhal, Hypertrophic and Atrophic. The second may appear in many forms and [illegible] varieties have been described. But the gastroscopist [illegible] too close a distinction between these forms, for they are probably [illegible] variations according to the extent and severity of the lesion. It is important to know that these three types of gastritis may be present together.

*Superficial or Catarrhal Gastritis.*—In its simplest form this can be looked upon as the stomach after the night before. In mild cases the mucosa is abnormally red, particularly in the distal half of the stomach. There is an excess of mucus which clings to the mucosa. The latter appears to be thick and velvety, not reflecting the light so brilliantly as the normal. It may bleed easily and there may be some small erosions. A mild form of catarrhal gastritis is often seen during an acute phase [illegible]

*Hypertrophic Gastritis.*—This is readily recognizable and exists in many forms. It is usually characterized by thickening of the rugae with deepening of the intervening furrows. Distension does not obliterate the rugae, which may show irregularities both in size and direction. In extreme cases the mucosa may hypertrophy, having a mammillated appearance, or even develop polyposis—though this is rare. There seem to [illegible]. There may be accumulation of debris between the rugae [illegible] although not frequently.

*Atrophic Gastritis.*—Here the changes consist of thinness and pallor [illegible] rugae in the moderately distended stomach. The [illegible] pale [illegible] and may have a greenish tinge and [illegible] important [illegible] blood vessels may be visible through the thin mucosa. [illegible] may accompany or follow the hypertrophic form and then is distributed in patches. In the [illegible] that present [illegible] example in pernicious anaemia—the appearance is usually uniform. The mucosa [illegible] dead white and the delicate tracery of the vessels is [illegible]

*Gastric Ulcer.*—A gastric ulcer is [illegible]

4

[illegible]

### The Post-operative Stomach

Many are the cases who develop further symptoms [illegible] upon the stomach for gastric or duodenal ulcer, and here [illegible] field of inquiry for the gastroscopist. In nearly all these cases the operation has been a gastro-enterostomy for duodenal ulcer. Symptoms [illegible] this are so common that I have no hesitation in condemning this operation for the cure for free duodenal ulcer. In a series of 430 [illegible] I had kept records no less than 61 were in cases of recurrent symptoms following operation upon the stomach. In 56 the operation had been [illegible] gastro-enterostomy—42 for duodenal ulcer and 14 for gastric ulcer. Of the remaining 5, 1 was sleeve resection for hour-glass [illegible] partial gastrectomy for ulcer, 1 partial gastrectomy for [illegible] simple excision of ulcer.

The gastroscopic findings in cases who have had a gastro-enterostomy for duodenal ulcer were many and varied. In 3 of them [illegible] had developed [illegible] the stoma and 1 distal to it. In 2 others a [illegible] of the stomach had appeared on the lesser curve. That [illegible] gastric ulcer can develop in a stomach after gastro-enterostomy [illegible] confidence in the ability of the operation to cure an ulcer.

Of the other 37 cases nothing abnormal [illegible] 10 and their symptoms were due to [illegible] duodenum.

In the remaining 27 the symptoms were due to [illegible] the stomach and the stomach wall in its immediate neighbourhood. The findings [illegible] from a stomal ulcer—this in 3 patients—to persistent [illegible]. The most often appeared to be a cellulitis of the stomach wall [illegible] and hypertrophic gastritis. Œdema of the mucosa [illegible] only seen. In many a stomal ulcer was present and found at operation but it was not to be seen at gastroscopy either because [illegible] on the jejunal side of the stoma or because the whole of the [illegible] the field [illegible].

Usually a stoma placed on the posterior wall [illegible] is easily seen and readily recognized. The more [illegible] the less plainly it can be demonstrated and it is sometimes only possible to get a view of the proximal or distal edge of it—sufficient usually to enable one to ascertain the pathological condition present. There can be no doubt that the treatment of these cases is partial gastrectomy. The gastroscopist has a big responsibility here, for at laparotomy nothing very convincing may be seen and the surgeon may be tempted by the negative external findings to shrug his shoulders and close the abdomen. An alternative to gastrectomy in some patients is to undo the gastro-enterostomy—but the results of this I have rarely found to be satisfactory.

### INDICATIONS

What are the indications for gastroscopy? In April 1936 (*British Medical Journal*, [illegible]) I wrote as follows: "Gastroscopy is unquestionably a very useful addition to our methods of investigating cases of gastric disorder. Whether it will become a routine method as cystoscopy has in diseases of the urinary tract is a matter that will be decided in years to come." It can be said to-day that gastroscopy has established itself as a routine procedure. The gastroscopist at the beginning will or should gastroscope all cases in which gastric or duodenal lesions are suspected or known. As time passes he will select his own indications and will probably refrain from doing the examination in such cases as the uncomplicated duodenal ulcer, or the [illegible] gastric cancer.

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## THE TREATMENT OF GONORRHŒA BY M & B 693 IN HONG KONG

Surgeon Lieutenant R. NORSWORTHY, R.N.

The older methods of treating gonorrhœa, including the use of streptocide, were employed at the V.D. Centre, H.M. Dockyard, Hong Kong, until September 1939. At about that time the JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE dated July 1939 arrived in the Colony. This issue contained an article by Surgeon Lieutenant-Commander Belcher on M & B 693 as used in the Royal Naval Barracks, Portsmouth, in the treatment of gonorrhœa. His results were so exceptional that it led me to undertake a similar survey of a comparable number of cases and to attempt to draw a comparison between the results obtained in Hong Kong and Portsmouth.

In forming any conclusion there are at least two factors to consider: the possibility of a difference in virulence or strain of the organism, and the influence of climate. Assuming no very great difference in the first factor, I considered that [illegible] less could be achieved owing to the climatic factor. The result of this proved to be the case. [illegible] however [illegible] regarding the institution of this treatment, the results are [illegible] than satisfying. The average number of days spent on the C.D.A. list has been [illegible] reduced from 65 under the old treatment to 34 under the new. A further analysis of the number of days spent on the sick list [illegible] later.

### CLIMATIC NOTES

The cases recorded here were treated during the ten months from September 1939 to July 1940. In this period practically the entire climatic cycle [illegible]. The autumn and early winter were [illegible]. The weather [illegible] dry and of average temperature. The change from white to [illegible] was made during the [illegible] week of November, a week later than the previous year, but at a date [illegible] to the normal. 1940 has proved extremely wet and is likely to [illegible] record in Hong Kong. Over 30 in. of rain fell in June [illegible] the average annual fall was exceeded during July. The mean humidity has been above average but in the later months the mean temperature [illegible] slightly below average. Weather conditions have not favoured the rapid [illegible] infections and contagious diseases, particularly [illegible] which have been common. For comparison with English figures the following are the official figures supplied by the Royal Observatory, Hong Kong.

TABLE I

| Month | Mean temperature Min. | Mean temperature Mean | Mean temperature Max. | Mean humidity Percentage | Rainfall Inches |
|---|---|---|---|---|---|
| 1939 | | | | | |
| Sept. | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Oct. | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Nov. | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Dec. | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1940 | | | | | |
| Jan. | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Feb. | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| March | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| April | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| May | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| June | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| July | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Normal | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

It should be explained that all [illegible] cases which have spent the minimum time [illegible] in treatment [illegible]. A further hundred or more [illegible] have been treated by the same method but [illegible] have been [illegible] the [illegible] treatment [illegible]. Others have come in as V.D. [illegible] from ships returning [illegible] M. & B. 693. None of these are included in the series.

In every case Sergeant [illegible] Boldero [illegible] out as faithfully as possible [illegible] examined [illegible] separately and [illegible]. It has not been possible to [illegible] white count in every case, but this has been done in all cases of doubt. Further details of treatment and control are discussed at a later stage.

No cases other than those showing Gram-negative diplococci in the smears have been included in the series. It does include, however, those showing only extra-cellular diplococci. I believe that a great number of cases show ingestion of organisms by the leucocytes for a limited period only. When M & B 693 is administered all organisms whether intra- or extra-cellular tend to disappear completely from the smear at an early stage and the intracellular period is further shortened and may be missed altogether. Every one of these cases has had a smear prepared at a time during which a discharge has been present. In a number of them diplococci have been found in the cells in only one or two [illegible] and in a majority of them in only two or three [illegible]. The picture then reverts to one of pus with extra-cellular organisms, then to [illegible] pus, then finally, before dryness is reached, to a [illegible] pus cells with desquamated epithelial cells.

If in the first smear there are no organisms or organisms present other than Gram-negative diplococci, it is my practice to order saline irrigations [illegible] and to repeat the smear in the following morning and again on the [illegible] before instituting further treatment. In many [illegible] negative smears [illegible] Venereal diagnosis [illegible] complement [illegible] In addition [illegible] series of [illegible]

[illegible] in these showing Gram-negative [illegible] both intra-cellular and [illegible] previous history is known.

[illegible] approximately the same form as that used by Surgeon Lieutenant-Commander Belcher. I hope that he will forgive the [illegible] in order to facilitate comparison between the [illegible]

## General Summary of Cases

The [illegible] from 1941-43 with the [illegible] present [illegible] 141 days [illegible] (87.3 per cent) [illegible] Surgeon Lieutenant-Commander Belcher's figures [illegible]

Treatment [illegible] diagnosis of gonorrhoea was established. [illegible] administration of the drug within an hour or so [illegible]

[illegible] 14 cases (vide Appendix [illegible]) [illegible] periods when the [illegible] not included in the [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] urethroscope is passed on the eighth day dry. The examination being satisfactory, the patient is then discharged to duty on the ninth day dry so [illegible] the urine is again normal.

[illegible] the state of the urethra by the urethroscope, it is not possible to lay down hard and fast rules so far as the degree of hyperaemia is concerned. I have found that the vast majority of cases show hyperaemia [illegible] weeks after the disease is cured by all other criteria. The degree of hyperaemia which I accept as fit for duty cannot be expressed in so many words, [illegible] judging by the small percentage of relapses, it is apparently [illegible]. The presence of visible follicles is likewise of no especial [illegible] their size, so long as they are not grossly exuding pus [illegible] inflamed or pouting.

[illegible] urethra will not admit a size 22 speculum (the [illegible] urethroscopy is replaced by a further examination [illegible]. Working in Hong Kong [illegible] a smaller speculum, this is the best which can be done.

M & B [illegible] the C.D.A. [illegible] patients are kept under observation [illegible]. The follow-up routine which I have evolved is as follows: [illegible] for a fortnight and a prostatic [illegible]. Prostatic smears are then taken [illegible] a further [illegible] and then monthly for a further two months, so [illegible]. This period has not always been possible to [illegible]. Thirteen cases in this series [illegible] after their return to duty, and [illegible] in the percentage of relapses.

[illegible] given here under their [illegible].

### RESULTS OF TREATMENT

[illegible] drug has a better effect in [illegible]. The figure for [illegible] more previous [illegible]. The [illegible] was small, however, being only 8 [illegible] Table II [illegible] the figure is probably not a true representation of the [illegible] affairs. [illegible] the number of cases with unknown [illegible] only fifteen.

It [illegible] that intracellular [illegible] in M & B 693 than do extracellular infections. The [illegible] the course of the investigation. Accordingly [illegible] this observation. [illegible] regards the number of [illegible] index of the phagocytic powers of the body than [illegible].

The [illegible] cases of the early [illegible] extracellular [illegible] to increase the [illegible] effort to increase phagocytosis. This [illegible] pursuing [illegible].

### RESISTANCE TO TREATMENT

In this [illegible] there were 43 cases on the [illegible] as against 50 in Surgeon Lieutenant-Commander Belcher's [illegible]. This is not a particularly disappointing number when one considers the difficulties and unpleasantness of the [illegible] in a Hong Kong summer. Notes on [illegible] these resistant cases are given in Appendix C.

If a patient still has a discharge at the end of the course of M & B 693 he is put on irrigations of [illegible] 1/15,000. [illegible] to be the most effective [illegible] to follow immediately upon M & B 693. These are discontinued after one week and if [illegible] is still present [illegible] is not usually the case) various forms of therapy are resorted to. These include *inter alia* irrigations of potassium permanganate 1/10,000 [illegible] 1/12,000, protargol 5 per cent or 10 per cent, mixed gonococcal [illegible] massage of the urethra with mercurochrome over a W.P.'s [illegible] or a second course of M & B 693.

As soon as dryness is obtained with these secondary forms of treatment then the routine of [illegible] and passage of sounds is started.

### [illegible] OF PATIENTS

The usual diet recommended for the sulphonamide group of [illegible] used. Messing in H.M.S. *Tamar* is done by compartments and it has been found practicable to [illegible] and other sulphur-containing foods from the diet of gonorrhoea patients [illegible] affecting the [illegible] chronic cases. Sulphates [illegible] are excluded from any additional medication given. For constipation [illegible] some other form of aperient.

## COMPLICATIONS

The [illegible] other than prostatitis has been [illegible] [illegible] epididymitis [illegible] per cent [illegible] Appendix A (Case 12) [illegible] the epididymitis [illegible] M & B 693 was administered and is [illegible]

[illegible] (Case 88 Appendix A)

[illegible] prostatitis [illegible] 46.6 per cent. This figure [illegible] nearly with the expected percentage [illegible] with the figures one might expect [illegible] has been responsible for the [illegible] than method [illegible] responsible for raising the figure [illegible] the last.

The [illegible] in the presence of [illegible] which may [illegible] on the patients [illegible] almost always [illegible]

[illegible] the above figures [illegible] (60 per cent) prostatitis.

## [illegible]

[illegible] in [illegible] and have [illegible] M & B 693 and the [illegible] gallery [illegible]

[illegible] is compared [illegible]

[illegible] which has [illegible] given the drug [illegible] the N.A.B. had [illegible] a double [illegible] afterwards of [illegible] had been given. [illegible] and 1 in the [illegible] rose to 102 F. [illegible] ment and [illegible] character, generally cramped and [illegible] [illegible]. In both cases the blood was entirely normal. [illegible] treatment given other than rest in bed [illegible] the course of M. & B. [illegible] interrupted. Nausea, vomiting and headache [illegible] mild headache the other.

At this point it is perhaps as well to explain [illegible] in Hong Kong with regard to venereal cases. All [illegible] small ships, trawlers, gunboats, &c., not carrying medical officers, from ships [illegible] the various shore establishments and from H.M.S. *Tamar* [illegible] in the V.D. Centre. Upon being put on the [illegible] transferred to H.M.S. *Tamar* for the period of their treatment. [illegible] mess in the Venereal Mess, unless they [illegible] in which case they are accommodated [illegible] Centre. If a man is excused duty he [illegible] H.M.S. *Tamar* [illegible] in the Centre during the day. Owing to the [illegible] men in the port it is almost always necess[illegible] their own ships during working hours [illegible] They then return to H.M.S. *Tamar* for the rest [illegible] and establishments outside the dockyard [illegible] gun sweepers, &c., in H.M.S. *Tamar*.

I have made it a rule that men [illegible] M. & B. [illegible] in H.M.S. *Tamar*, and not be allowed [illegible] that they shall be under reasonably close [illegible] If any man shows the slightest sign [illegible] ideally close observation, and it is [illegible] the V.D. Centre, and kept there until [illegible] severe cases have had their blood examined [illegible] or leucopenia, but none has yet been found.

Only three cases have had the drug stopped [illegible] but in all cases the [illegible] forty-eight hours.

RELAPSES AND REINFECTIONS

Surgeon Lieutenant-Commander Belcher [illegible] cent. as his expectation of the relapse rate. [illegible] ing in Hong Kong. Three of the cases [illegible] showed Gram-negative bacilli in their smears. They all [illegible] to eight weeks after their discharge from the [illegible] to say that the figure of 6 per cent. excludes [illegible] Hong Kong shortly after their discharge from the first [illegible] have materially altered the percentage.

## CONCLUSIONS

No one can deny that in M & B 693 we have a very powerful ally in the treatment of coccal infections, and so far as the Navy is concerned particularly in the treatment of [illegible]. It is by now sufficiently well known not to require emphasis [illegible]. Like all good things, however, it has a snag. [illegible] to have the idea that [illegible] they've got the tablets [illegible]. They are tending to regard prophylaxis as of minor importance, and an attack of gonorrhoea as an interlude and a short change [illegible]. It has been reported to me that one Petty Officer [illegible] "I shan't bother about getting another dose [illegible]" and has some of these tablets. Unfortunately many of the Chinese chemist shops in Hong Kong are not scrupulous about selling drugs of this nature without a prescription. For this reason [illegible] In the past I have frequently heard from patients that they have been treating [illegible] and a man so treated has both [illegible].

Even though the drug [illegible] is undoubtedly [illegible] not only the number of days spent on the [illegible] but also the number of [illegible] treatment [illegible] complications.

I would like to thank Surgeon Lieutenant-Commander Belcher for the [illegible] between Hong Kong and Portsmouth [illegible] appreciation of the interest shown by the Sick Berth Staff of the V.D. Centre [illegible] which has entailed a considerable amount of extra work.

APPENDIX A

| | Da[illegible] | A[illegible] | [illegible] | M & B | N[illegible] | [illegible] | Epididymitis | Prostatitis |
|---|---|---|---|---|---|---|---|---|
| [illegible] | 1 | 15 | | 1 | | 1 | | |
| [illegible] | 1 | 8 | | 1 | | 1 | | |
| [illegible] | [illegible] | 14 | | 1 | | 1 | | |
| [illegible] | [illegible] | 11 | | 1 | | – | | |
| [illegible] | [illegible] | 11 | | 1 | | | | |
| [illegible] | | 8 | | | | 1 | | |
| [illegible] | | 11 | | 1 | | 1 | | |
| [illegible] | | | | 1 | | | | |
| [illegible] | | 1 | | | | | | |
| [illegible] | | | | | | 1 | | |
| [illegible] | [illegible] | 5 | | 1 | | 1 | | |
| [illegible] | 11 | 8 | | 1 | | 1 | | |
| [illegible] | [illegible] | [illegible] | | 1 | | | | |
| [illegible] | [illegible] | [illegible] | | 1 | | 1 | | |
| [illegible] | [illegible] | [illegible] | | 1 | | 1 | | – |
| [illegible] | | 11 | | 1 | | | | |
| [illegible] | | | | | | 1 | | |
| [illegible] | | [illegible] | | 1 | | | | |
| [illegible] | | | | 1 | | 1 | | |

| Case | Days on C.D.A.L. | Courses M. & B. | No. of attacks | Epididymitis | Prostatitis |
|---|---|---|---|---|---|
| 86 | 21 | 1 | 3 | | |
| 87 | 59 | 1 | 2 | | |
| 88 | 69 | 1 | 1 | | |
| 89 | 14 | 1 | 1 | | |
| 90 | 48 | 1 | 2 | | |
| 91 | 145 | 1 | 2 | | |
| 92 | 11 | 1 | 1 | | |
| 93 | 21 | 1 | 2 | | |
| 94 | 35 | 1 | 1 | | |
| 95 | 11 | 1 | 1 | | |
| 96 | 24 | 1 | 1 | | |
| 97 | 21 | 1 | 1 | | |
| 98 | 28 | 1 | | | |
| 99 | 21 | 1 | 1 | | |
| 100 | 3 | 1 | | | |
| 101 | 48 | 1 | 2 | | |
| 102 | 18 | 1 | 2 | | |
| 103 | — | 1 | 1 | | |
| 104 | 21 | | 1 | | |
| 105 | 11 | 1 | 1 | | |
| 106 | 1 | 1 | 2 | | |
| 107 | 110 | 1 | 4 | | |
| 108 | 14 | 1 | 1 | | |
| 109 | 15 | 1 | 2 | | |
| [illegible] | [illegible] | 1 | | | |
| [illegible] | [illegible] | 1 | | | |
| [illegible] | 4 | 1 | 1 | | |
| [illegible] | 11 | 1 | 1 | | |
| [illegible] | 21 | 1 | 1 | | |
| [illegible] | 7 | 1 | 1 | | |
| [illegible] | [illegible] | 1 | | | |
| [illegible] | 1 | 1 | 1 | | |
| [illegible] | 124 | 1 | 1 | | |
| [illegible] | [illegible] | 1 | | | |
| [illegible] | 11 | 1 | 1 | | |
| [illegible] | 15 | 1 | 1 | | |
| [illegible] | [illegible] | 1 | 1 | | |
| [illegible] | 1 | 1 | 1 | | |
| [illegible] | 11 | 1 | 1 | | |
| [illegible] | 4 | 1 | 1 | | |
| [illegible] | 11 | 1 | | | |
| [illegible] | 15 | 1 | | | |
| [illegible] | 9 | 1 | 1 | | |
| [illegible] | 19 | 1 | 1 | | |
| [illegible] | 55 | 1 | | | |
| [illegible] | [illegible] | 1 | 1 | | |
| [illegible] | 45 | 1 | 2 | | |
| [illegible] | [illegible] | 1 | | | – |
| [illegible] | [illegible] | 1 | 1 | | |
| [illegible] | 1 | 1 | 1 | | |
| [illegible] | [illegible] | 1 | 1 | | – |
| [illegible] | 45 | 1 | 1 | | |
| [illegible] | 15 | 1 | 1 | | |
| [illegible] | 15 | 1 | 1 | | |
| [illegible] | 15 | 1 | 1 | | |
| [illegible] | [illegible] | 1 | 3 | | |
| [illegible] | 16 | 1 | 1 | | |
| [illegible] | 1 | 1 | 2 | | |
| [illegible] | 14 | 1 | 3 | – | |
| [illegible] | 4 | 1 | 1 | | |
| [illegible] | 18 | 1 | 2 | – | |
| [illegible] | 11 | 1 | 4 | | – |
| [illegible] | 15 | 1 | 4 | | |
| [illegible] | [illegible] | 1 | 1 | | + |
| [illegible] | 1 | 1 | 1 | | |

# VITAMIN C IN COLLECTIVE FEEDING

By S. S. ZILVA
*East Malling Research Station, Maidstone, Kent*

## INTRODUCTION

In order to assess the adequacy of a diet with respect to vitamin C [illegible] questions have [illegible] vitamin per man [illegible] Unfortunately, with our present knowledge [illegible] in the literature in this connexion. [illegible] object of the present [illegible] on this subject in order to [illegible] complexity of the problem, and at the same time [illegible] the [illegible] knowledge can be applied [illegible] possible [illegible]

## THE VITAMIN C REQUIREMENTS OF MAN

[illegible] information [illegible] it is concluded that man develops [illegible] existing on [illegible] months [illegible] preceded by [illegible] [illegible] with [illegible]

The following facts [illegible] been established experimentally [illegible] the [illegible] organism. [illegible] When the subject [illegible] When the [illegible] [illegible] scurvy but [illegible] with the tissues [illegible] an uncommon occurrence. In the Army and Navy, except in [illegible] conditions of warfare, the ration is rarely free of vitamin C. Sometimes the supply of the vitamin may be capable of maintaining [illegible] though insufficient for this purpose it may still be adequate not only to prevent clinical scurvy but also to insure good health. The possibility must, however, be visualized that under certain conditions the intake may be [illegible] in order that doubt is provoked as to its adequacy for the maintenance of normal health even if clinical symptoms be absent.

Although, as mentioned above, the minimum daily dose of ascorbic acid necessary to maintain normal health is not known precisely, sufficient reliable information is available to indicate the approximate magnitude of such a dose. In order to arrive at this it is necessary to have recourse to results obtained experimentally on guinea-pigs. This method of experimentation obviously lends itself to greater precision than observations made on human beings. A daily dose of 0.5 to 1 mg. of ascorbic acid usually prevents the onset of clinical scurvy in a growing guinea-pig weighing about 300 g., and on this dose macroscopic signs of scurvy are seldom observed at the post mortem. The animal is not, however, fully protected, since microscopic lesions in the pulp of the teeth are usually found. A dose of about 2 mg. is required to prevent the development of these lesions. On this dose, although no traces of ascorbic acid can be found in the tissues, the animal can apparently lead a normal existence. Perceptible traces of the vitamin make their appearance in certain 'selective' organs, such as the adrenals, pituitary, liver, small intestines, &c., only when the daily dose is raised to 5 to 8 mg., i.e. about three times the dose which prevents the production of macroscopic and *microscopic* lesions. About ten times this daily dose (about 20 mg.) is required to attain the maximum concentration of the vitamin in the tissues, i.e. to attain saturation. The writer, experimenting on himself and his colleagues under carefully controlled conditions, found this saturation dose to be 30 to 40 mg. per day. On the assumption that the proportion holds true in man as in guinea-pigs, a daily dose of 3 to 4 mg. (one-tenth of the saturation dose) would have been required to prevent in them the development of macroscopic and microscopic lesions of scurvy; 10 to 15 mg. to produce a slight but significant deposition of ascorbic acid in the tissues. This daily dose is probably the approximate minimum requirement of man. In practice it would perhaps be wiser to ensure a margin of safety, particularly to allow for individual variation. A dose, therefore, lying in the region of the saturation dose, 20 to 30 mg., may be considered as suitable. No undue clinical significance need, however, be attached to maintaining a condition of saturation. There is no reliable evidence to show that mere unsaturation indicates a 'hypovitaminosis C', subclinical scurvy, or any other pronounced condition of the disease. There are indications that rather suggest that complete saturation is an "abnormal" condition. Unless doses very much higher than those required to prevent clinical scurvy are constantly consumed, unsaturation tends to set in quickly. Nor does the accumulation of ascorbic acid in the tissues act as a store in the true sense of the word, at least in the guinea pig, since saturation in these animals does not delay either the onset of scurvy or the fatal termination of the disease when placed on a scorbutic diet.

### THE AVAILABILITY OF THE ASCORBIC ACID OF THE DIET FOR MEETING THE REQUIREMENTS OF MAN

There is usually no lack of values for the vitamin C content of natural products. The usual tables give, in many cases, a number of varying values. A close scrutiny of the literature fails in most cases to disclose the reason for this disparity. The variation in content is in all probability due to either one or more of several factors, mainly environmental, such as variety, season, prevailing meteorological conditions, storage, &c. At best one can only obtain approximate values by reference to the literature. The availability of vitamin C in the natural products of the ration is further complicated by the loss due to cooking, canning, and even during the time elapsing between the cooking and actual consumption, loss in the vitamin may be incurred. So many uncontrollable variables are involved in this investigation that it is almost impossible to predict on theoretical grounds how much of the original vitamin C will be left at the time of consumption. Figures given in this connexion in the literature cannot be considered as final since they are based on [illegible] observations. To this may be added occasional faulty technique [illegible] and theoretical interpretation of results. Great caution must particularly be exercised in connexion with figures given for canned products. In the absence of something short of scientifically standardized methods in cooking and canning of the food, based on prolonged systematic investigation, [illegible] cannot yield anything like satisfactory results. Such [illegible] at present incompatible with practice. The standardization of canning seems to be a more practical proposition for canned food [illegible] different countries.

Therefore, in normal times, owing to the abundant presence of vitamin C in [illegible] consumed in this country, the destruction of the vitamin by the process of cooking, &c., need not cause any serious anxiety. In abnormal times, however, and particularly in the case of collective feeding, the problem cannot be treated with the same equanimity—not so much perhaps because of the risk of frank scurvy as for a possible subtle deterioration in health during prolonged latent borderline conditions. It is therefore [illegible] that [illegible] should be the adoption of methods which would [illegible] consumption in *the diet* of at least 10 to 15 [illegible] 20 [illegible] mg. of ascorbic acid per man per day.

# Clinical Notes and Cases

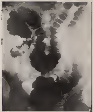
## AN UNUSUAL CASE OF REGIONAL ILEITIS

[illegible]

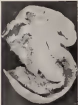
[illegible]

[illegible]

[illegible]



[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

## [illegible]

### [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

REFERENCE

[illegible]

---

## [illegible] EPIDIDYMITIS

[illegible] M. BARDEN, R.N.V.R.

[illegible]

[illegible]

[illegible]

[illegible]

* * *

## [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

## [illegible]

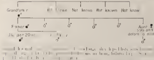
[illegible]

[illegible]

[illegible]

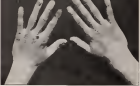
[illegible] healed well and [illegible]

[illegible] he states that [illegible] similar trouble [illegible] His only [illegible] nails were [illegible] father's hands [illegible]



[illegible] follows [illegible]

[illegible]



[illegible]

[illegible] congenital malformation [illegible] the epidermis appears [illegible] Some cases [illegible] Mead [3] and Sutton [1] [illegible] of the skin [illegible] the result of [illegible]

[illegible]

[illegible]

---

[illegible] Surgeon Rear-Admiral [illegible] [illegible] Surgeon Commander [illegible] Lieutenant-Commander [illegible] and especially to Surgeon Commander [illegible] and criticisms in the preliminary [illegible] paper.

## REFERENCES

[illegible] *Journal of* [illegible]

[illegible] Administration of [illegible]

[illegible] *Journal of* [illegible] 24.

[illegible] Medicine [illegible]

[illegible] R.M. [illegible]

---

## PLASMA TRANSFUSION

### By Surgeon Commander [illegible] R. SORIBY, M.D., Ch.B., D.T.M.H., R.N.

[illegible]

[illegible]

(1) [illegible] blood [illegible]

(2) [illegible]

(3) [illegible]

(4) [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

### REFERENCE

1) Brennan, H. J., *British Medical Journal*, [illegible] 1950, [illegible]

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## A CASE OF GONOCOCCAL OPHTHALMIA

By Surgeon Lieutenant-Commander S. J. WHEELER, M.B., R.N.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

---

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

### [illegible]

1. [illegible] 20 [illegible]
2. [illegible] 3 [illegible]
3. [illegible] 93, [illegible]
4. [illegible] 2, [illegible]
5. [illegible] 32, [illegible]
6. [illegible]
7. [illegible] 108, [illegible]

## [illegible]

### [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

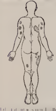
[illegible]

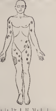
[illegible]

[illegible]

[illegible]

[illegible]





[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

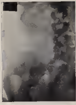
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible] Examination of the spine showed [illegible] in the lumbar region [illegible] and the left [illegible] [illegible] of equal length [illegible]

Notes

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

## [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

* * *

## Correspondence.

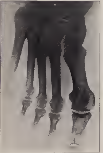
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

◆

# Reviews.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

TREATMENT [illegible]

[illegible]

[illegible]

FRACTURES [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] flying bein [illegible] fight [illegible] during [illegible] and of [illegible] chapter [illegible] aspect [illegible] amuse [illegible] Ground [illegible] have to [illegible] officer [illegible] when the [illegible] ness [illegible] section [illegible] relationship [illegible]

M. C.

A Guide to Human [illegible] By D. B. Bl[illegible] M.D. [illegible]

[illegible]

H.

W[illegible] Women and [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] obtainable

[illegible]

[illegible] land [illegible] coloured [illegible]

[illegible]

SURGERY [illegible] WARFARE. PART II. Section II [illegible] Spinal [illegible] Section III. Wounds [illegible] IV. Wounds [illegible] Blood-vessels. Edited by Hamilton [illegible] Hospital, &c. Compiled b[illegible] November 1940. Pp. ix + 1[illegible] [illegible] Edinburgh [illegible]

[illegible] illustrated [illegible] the high [illegible] What [illegible] further [illegible]

H. [illegible]

◆

# News of the Service

## NOTICE.

[illegible] R.N. has been [illegible] Naval Medical Service [illegible] Surgeon Captain [illegible] R.N.

## ADMIRALTY ORDERS

### [illegible]—Re-entry of Men Who have been Invalided

(N. [illegible] 1940.)

[illegible] or the [illegible] Admiralty approval [illegible] who [illegible] for further [illegible]

### [illegible]—Women's Royal Naval Service.—Invaliding

([illegible] 12.3.1940.)

[illegible] Women's Royal Naval Service [illegible] to be [illegible] with a [illegible] established R.N. Sick Quarters [illegible] will be [illegible] Naval [illegible]

### 3462.—Tetanus Prophylaxis

(M.D.G. [illegible] 12.3.1940.)

[illegible] the following procedure has been recommended [illegible] War Wounds Committee [illegible]

[illegible] tetanus toxoid [illegible]

[illegible] by intramuscular [illegible] a single dose of 3,000 [illegible]

[illegible] three doses each of [illegible] [illegible] and the single dose [illegible]

### 3532.—Queen Alexandra's R.N. Nursing Service Reserve—National Health and Pensions Insurance.

(C.W. [illegible] 12.9.1940.)

The Minister of Health [illegible] provisions of [illegible] paragraph (c) and (d) are not [illegible] will [illegible]

2. Forms [illegible] in respect of all members of this Reserve serving on [illegible] after September 3, 1939, whether they were previously [illegible] and [illegible] in respect of those subsequently discharged [illegible] transferred to Queen Alexandra's R.N. Nursing Service, [illegible] Health [illegible]

### 3533.—Forms M.235 and M.235A—Dental Statistical Returns

(M.D.G. [illegible] 10 [illegible] 1940.)

Forms M.235 and M.235A have been [illegible] and will supersede the existing [illegible] should be [illegible]

2. Only two sections will in future be used [illegible] the Return [illegible] undertaken for Officers [illegible] The Return [illegible] December [illegible] and [illegible] special [illegible] on foolscap paper [illegible] Return [illegible] The blank spaces between the [illegible] Form M.235A [illegible] used for recording [illegible]

3. The rendering of [illegible] Form M.235B will be dispensed with [illegible] the [illegible] first day [illegible] following:

Number of days employed during the previous month
Number [illegible]
Number [illegible]
Number of [illegible]
Number [illegible]
Number of [illegible]
[illegible] special [illegible]

4. [illegible] Dental Officer [illegible] employed [illegible] the Senior Dental Officer [illegible] returns will be [illegible] Dental Officer [illegible]

### 3560.—Queen Alexandra's Royal Naval Nursing Service and Reserve

([illegible] 1940.)

Members of Queen Alexandra's Royal Naval Nursing Service and of Queen Alexandra's Royal Naval Nursing Service Reserve [illegible] the Minister of Health [illegible] under the [illegible] Naval and Marine personnel.

### 3591.—Form S.31—Revision—Form S.31a—Abolition

(M.D.G. [illegible] 1940.)

Form S.31 [illegible] Dental [illegible]

[illegible] Royal Naval [illegible] Victoria [illegible] Hospital.

[illegible] Form S.31a has been [illegible] Health.

[illegible]

[illegible]

[illegible]

## 3672—R.N. Medical School—Address—Instructions for Despatch of Samples for Analysis or Specimens for Opinion

(M.D.O. [illegible] —20.1.1930.)

Attention is again drawn to the address of the Royal Naval Medical School, which is:—Royal Naval Medical School, [illegible] White House, Highfield Road, Clevedon, [illegible] [illegible] analyses and pathological specimens for opinion are not infrequently still sent to R.N. College, [illegible] with consequent delays and other difficulties.

*Water Samples for Examination.*—When water analyses are required [illegible] should be obtained from R.N. Medical School, [illegible] stating whether for chemical or bacteriological analysis and the number required. [illegible] supplied sterilized and in special containers, and it is important [illegible] strictly complied with. They must [illegible] immediately after collection by the most expeditious route [illegible] passenger [illegible] marked "URGENT."

*Pathological Specimens for Report.*—Specimens for [illegible] sent to the Professor [illegible] should be forwarded securely packed and [illegible] marked [illegible] and packed in accordance with P.O. regulations.

## 3681—Form S.579—Abolition

(Stn. 16/10/10—28.2.1930.)

[illegible] to be abolished:—
[illegible] Hospital Entry and Discharge.

## 3691—Prevention of Reactions in T.A.B. Inoculation

(M.D.O. [illegible]—10.1.1930.)

1. [illegible] reactions from T.A.B. inoculations attention is drawn to the [illegible] [illegible] intramuscular injections [illegible] general reactions and a lower degree of immunity.

2. [illegible] syringe [illegible] should be done by boiling. Methylated spirit [illegible]

3. The [illegible] where practicable after inoculation is also emphasised.

### 3848.—Fleet Air Arm—Supply of Optically Corrected Flying Goggles

(A. 719 [illegible] 11.10.1940.)

Flying goggles fitted with optically corrected lenses will be supplied at the [illegible] expense to flying personnel (pilots, observers or air gunners) who [illegible] [illegible] prescription by an ophthalmic specialist [illegible] [illegible] [illegible] flying duties. The [illegible] supply [illegible] will be as follows:—

[illegible] the Medical [illegible] General [illegible] ophthalmic specialist's prescription [illegible] the supply of [illegible] goggles [illegible] the approved [illegible] [illegible] goggles [illegible] the Medical [illegible] the goggles [illegible] [illegible] [illegible] will then send [illegible] [illegible] [illegible] a form for pay [illegible] the goggles [illegible] [illegible] [illegible] [illegible] [illegible] flying kit [illegible] goggles [illegible] [illegible] [illegible] [illegible] [illegible] Medical [illegible] of Admiralty.

### 3863.—Transfer of Part of R.N. Hospital Portland to Minterne Magna, Cerne Abbas, Dorset

(M. [illegible] 1936/40 [illegible] 10.11.1940.)

Correspondence relating to R.N. Hospital Portland should be forwarded [illegible] to the Medical Officer in Charge, R.N. Auxiliary Hospital, Minterne Magna, Cerne Abbas, Dorset.

### 3887.—T124 X Agreement—Sick Leave and Medical Treatment for Officers

([illegible] 1940.)

[illegible] [illegible] medical treatment [illegible] [illegible]

### 3934.—Apparatus for Determining Residual Chlorine in Water

(N.S. [illegible] 1940.)

[illegible] [illegible] [illegible] [illegible] Medical [illegible] [illegible] [illegible] has already been [illegible].

The [illegible] [illegible] all of which [illegible] available stores [illegible]

| Pattern | Description | Quantity |
|---|---|---|
| | B [illegible] | 1 |
| 1158 | [illegible] | |
| 1159 | [illegible] | |
| 1160 | [illegible] | |
| 1161 | Glass [illegible] | 1 |
| 1162 | Colour [illegible] | |
| [illegible] | Chlorotex [illegible] | 1 |

[illegible] Further supplies [illegible] [illegible]

[illegible] should [illegible] should arrange for the [illegible] deposit [illegible] arranged.

[illegible] R.N. [illegible]

[illegible] removed will be [illegible]

### 3936—R.N. Medical Depot, Dunfermline

(M.D.G. 13865/40.—17.10.1940.)

[illegible] Medical Store Depot has now been opened [illegible] supplements of medical stores for all [illegible] Scotland (all the Naval Hospitals [illegible] or Plymouth Class.

### 3939—First Aid Outfits for Aircraft—Addition to Scale

(M.D.G. 28401/41.—17.10.1940.)

[illegible] included in future issues of First Aid Outfits [illegible]

[illegible] containing Oedema [illegible] will be supplied [illegible] Morphine [illegible] will [illegible] hydrate gr. 1/20 and [illegible] in future [illegible]

### 3965—Serving Medical Officers, R.N. or R.N.V.R.—Private Patients

(C.W. C.L. 58836/40.—21.10.1940.)

[illegible] been decided that Medical Officers, R.N. or R.N.V.R., whilst holding appointments [illegible] not accept as private patients naval or other personnel [illegible] treated at the public expense [illegible] King's Regulations and Admiralty Instructions, Article [illegible] will be amended.

### 3975—"Hostilities Only" Sick Berth Staff—Specialists and State Registered Nurses.

(M.D.G. 1883/40.—31.10.1940.)

Leading Sick Berth Attendants (temporary) [illegible] under the provisions [illegible] A.F.O. [illegible] in special cases [illegible] nursing skill and experience [illegible] be recommended for further advancement.

State Registered Male Nurses [illegible] will [illegible] A.F.O. [illegible]

[illegible] A.F.O. 2884 [illegible] paragraph [illegible]

### 4135—The Gilbert Blane Medal for Medical Officers, R.N., 1941—REPORTS

(M.D.G. C.W. 54880/40.—14.11.1940.)

The award of the Gilbert Blane Medal for 1941 will be [illegible] forwarded to the Medical Director General in accordance with the Regulations [illegible] Appendix to Navy List, page 165.)

[illegible] Applications for consideration for the award should reach the Medical Department [illegible] than March 31, 1941, enclosing information of work done and supported [illegible] evidence.

### 4097—Royal Canadian Naval Personnel Under Medical Treatment In or Out of Hospital

(M.D.G. 34410/40.—14.11.1940.)

The Canadian Legion War Services, Inc., 17 Cockspur Street, London, S.W.1, [illegible] provide comforts for the above.

[illegible] Royal Canadian Naval Personnel under treatment [illegible] hospital should be forwarded to the Legion at the address stated.

### 4296.—Entry of Men with Loss of one Eye

(N. 15485/40.—1.11.1940.)

[illegible] are regarded as being likely [illegible] "Hostilities Only" engagements [illegible] have [illegible]

2. [illegible] these men who are [illegible] Sick Berth ratings for shore [illegible] referred to [illegible] Admiralty for prior approval.

### 4298.—Medical Examinations of Personnel

(N. 18443/40.—2.11.1940.)

[illegible] large number of men now being entered in the Navy [illegible] medical examinations [illegible] [illegible] directed to the provisions of King's Regulations [illegible] Instructions, Article 1293, paragraph 3.

### 4348.—A.P. 1269—Manual for Medical and Dental Officers of the Royal Air Force—Issue of Appendices and Notes

(M.D.G. 42109/40.—1.11.1940.)

All medical officers in possession of Air Publication 1269 (Manual for Medical and Dental Officers of the Royal Air Force) are to [illegible] General for a copy of Air Publication 1269A (Appendices) and Air Ministry pamphlet 100A, Notes for guidance of Medical Officers [illegible] personnel [illegible]

### 4349.—B.R. 148/40—Memorandum on the Early Treatment of Closed Head Injuries

(M.D.G. [illegible]/40.—21.11.1940.)

A pamphlet entitled "Memorandum on the Early Treatment of Closed Head Injuries" is being published for the guidance of Medical Officers [illegible]

2. Copies of this pamphlet for issue to Medical Officers will be supplied on demand addressed to R.N. Store Depot, Royal Victoria Yard, Deptford, S.E.8.

### 4352.—Form M 179—Medical Officer's Journal—Compilation

(M.D.G. 43717/40.—21.11.1940.)

Personnel of Allied Navies who are treated in H.M. ships and establishments are to be recorded in a separate Alphabetical Sick List and Minor Injuries List but they are not to be included in Tables 3 and 4.

2. Table 4 (Form M 179B) [illegible] remarks of the ship [illegible] to be rendered [illegible] hostilities.

3. H.N.R. Officers [illegible] agreements are to be [illegible] in the Alphabetical Sick List and in Tables 3 and 4 (A.F.O. [illegible]/40, paragraph 3).

### 4365.—First Aid Treatment of Phosphorus Contaminated Wounds

(M.D.B. 42/40.—[illegible] 8.11.1940.)

The following information is being circulated by the Ministry of Health to [illegible] Medical Officers:—

(1) Immerse the affected part in water, or if sufficient water is not available, apply a thick pad soaked in water.

(2) Particles of phosphorus embedded in the skin should be removed [illegible] by means of gauze held in forceps.

(3) No oily or greasy dressings should be used.

(4) Wash with [illegible] or [illegible] sodium bicarbonate [illegible] [illegible] to a pint of water.

(5) Remove all traces of phosphorus by washing with 1 per cent solution of copper sulphate.

(6) Remove [illegible] black deposit of copper phosphide and wash with [illegible] antiseptic, e.g., boric acid.

(7) Apply a dressing for ordinary burns.

11

## 4291.—Queen Alexandra's R.N. Nursing Service—Board and Washing Allowances [illegible]

(C.F. 8297/40.—28.11.1940.)

The rates of Board and Washing Allowance payable to members of Queen Alexandra's R.N. Nursing Service [illegible] follows with effect from [illegible] 1940:—

| | £ | s. | d. | |
|---|---|---|---|---|
| At Home Stations [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| At Home Stations [illegible] the Sisters are employed | 1 | [illegible] | [illegible] | |
| At Foreign Stations | 1 | 8 | 6 | |

2. [illegible]

## 4292.—Drafting of Ratings Who Have Recently Suffered from Venereal Disease

(M.D.G. 13926/40.—28.11.1940.)

Attention is drawn to the recent [illegible] Drafting Regulations (B.R. 11 (1940) 33, Art. III, Clause 5) which [illegible]:—

No man who has had gonorrhoea should be drafted to a ship not carrying a medical officer until he has been found free from signs of the disease by means of the [illegible] special tests of cure.

## 4426.—New Virus Vaccine for Protection Against Influenza

(M.D.G. 44644/40.—28.11.1940.)

A [illegible] virus vaccine is available for issue to ships and establishments [illegible].

2. The [illegible] of [illegible] dose and should be given as soon as possible.

3. It has been found that this vaccine [illegible] and [illegible] produced.

4. In view of the danger of influenzal epidemics this winter all medical officers [illegible] to [illegible] as large a proportion as possible of Naval personnel [illegible] R.N. Hospitals. [illegible] will be supplied in the liquid form in 60 [illegible] ampoules. The contents of each should be dissolved [illegible] with [illegible] and then the drawing [illegible] obtained. Each [illegible] following [illegible] sterile distilled water. [illegible] should be kept in [illegible] if possible. [illegible] should be [illegible] as soon as possible [illegible] the same day.

It is most important that reliable figures should be obtained [illegible] the [illegible]. At the end of the quarter and at the end of the last quarter of 1940 [illegible] Medical Officer of ships and establishments should render a special report [illegible] following information:—

(1) Numbers receiving the new vaccine.
(2) Numbers not receiving the vaccine.
(3) Number of cases occurring in Groups (1) and (2) of:—
    (a) Typical influenza.
    (b) Common cold.
    (c) [illegible] throat and tonsillitis.
(4) General remarks including:—
    (a) Reaction after inoculation [illegible].
    (b) Relative severity of [illegible] in Groups (1) and (2).
    (c) Period elapsing [illegible] between the inoculation and the onset of influenza.

[illegible] Medical Officers should not apply [illegible].

## 4431.—Consumable Dental Stores—Demands

(M.D.G. [illegible]—8.11.1940.)

[illegible] H.M. ships and establishments [illegible] other dental [illegible] from the R.N. Medical Depot, [illegible] [illegible].

[illegible] prepared [illegible] be limited to [illegible] necessary to [illegible]

[illegible]

### 1635.—Free French Naval Forces—Accounting Procedure for Medical Stores

(M.D.G. [illegible])

The following [illegible] in respect of the Free French Naval Forces [illegible]

[illegible] R.N. hospitals [illegible] statement [illegible] Medical Director-General of the Navy [illegible] supplied [illegible] Any special purchases [illegible] recorded and reported.

Supplies made by H.M. ships should be reported [illegible] at the Admiralty [illegible]

### 1642.—Wounds Received in Action—Notation on Service Certificates

(N. 17836/40.—[illegible])

It has been brought to notice that notations are not being made [illegible] personnel who have been reported wounded in action.

2. Attention is called to the provisions of King's Regulations and Admiralty [illegible]

### 4628.—Fleet Air Arm—Annual Medical Examinations

(M.D.G. [illegible])

The general medical [illegible] of flying personnel of the Fleet Air Arm [illegible]

2. The attention of Medical Officers is drawn to [illegible] of all flying personnel [illegible]

3. Medical Officers [illegible] all flying personnel [illegible] and that Form M. 47 has been issued by the Medical Director-General.

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## BIRTHS.

M[illegible].—On [illegible] 1940, at Meyer [illegible] Barnards Green Road, Malvern [illegible] Surgeon Lieutenant-Commander [illegible] R.N. [illegible]

[illegible] Mrs. [illegible]

B[illegible] Nursing Home [illegible] Surgeon Commander [illegible] R.N. [illegible]

W[illegible] Nursing Home [illegible] R.N.V.R. [illegible]

Morr[illegible] Royal [illegible] R.N.V.R.

Pepp[illegible] Surgeon Lieutenant Richard Pepps, R.N.V.R. [illegible]

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## OBITUARIES

We regret to report the following deaths and extend our deepest sympathy to the relatives.

Surgeon Rear-Admiral Hugh Warren Bewitz, C.B., C.M.G., M.B., B.Ch., [illegible] F.R.C.S.Eng., was born on [illegible] 8, 1870, and died October 25, 1940. He was educated at the Royal School, Dungannon, [illegible] College, Galway, the University of Edinburgh

H*

[illegible] He qualified in 1898 [illegible] M.B., B.Ch., B.A.O. In 1908 [illegible] and two daughters.

[illegible] Wounded in Naval W[illegible] and retired [illegible]

[illegible] Medical [illegible] H.M. [illegible] R.N. Hospital [illegible]

[illegible]

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[illegible] Bean [illegible] ember 12, 19[illegible] educated [illegible] M.B. [illegible] 1901 [illegible] East Africa [illegible] 1901 [illegible]

---

[illegible] W. [illegible] M.B., Ch.B., R.N. [illegible] 1907 and [illegible] presumed dead [illegible] *Prince of Wales*, December 26, 1941 [illegible] 1939 and [illegible] appointments [illegible] following establishments: R.N. Hospital [illegible] Barracks, H.M.S. [illegible] H.M.S. *Ringlefield*, and H.M.S. *Imperial*.

Surgeon [illegible] R. I. Gennie, L.D.S., R.N. [illegible] 1888 and [illegible] in R.N. Hospital Haslar [illegible] the Royal Navy [illegible] Lieutenant (D) in 1914 [illegible] Lieutenant [illegible] 1920. On account of the [illegible] on the [illegible] with the rank of Surgeon [illegible] appointment [illegible] Haslar and Bermuda [illegible] month [illegible] he was appointed to Portsmouth [illegible]

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Temporary Probationary [illegible] Lieutenant B. H. Brush [illegible] M.B., [illegible] R.N.V.R. Born Jan. 19 1915 [illegible] December 1940. He [illegible] M.B., Ch.B. Liverpool in 1938 and joined the R.N.V.R. September [illegible] appointed to Portsmouth Barracks [illegible] to H.M.S. *Forfar*.

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Temporary Surgeon Lieutenant Geoffrey Bayboem [illegible] M.B., Ch.B., R.N.V.R., was born on [illegible] 1914 and was killed [illegible] He took his degrees at Bristol and was called up in the R.N.V.R. [illegible] appointed to Devonport Barracks, H.M.S. *Wanderer* and H.M.S. [illegible]

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Temporary Probationary Surgeon Lieutenant Harold [illegible] M.B., B.Ch., R.N.V.R. Born December 21 1911 and reported "Missing, presumed [illegible]" November 29 1940. He obtained his degrees at Dublin in 1937 and [illegible] the R.N.V.R. in July 1940, being appointed first to Devonport Barracks [illegible] to H.M.S. *Jersey*.

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Temporary Surgeon Lieutenant William Wedgwood Wildman, M.B., Ch.B., D.P.H., R.N.V.R., was born on May 1st 1898 and was killed in action in H.M.S. *Berwick* on November 2, 1940. He was educated at the University of Edinburgh and the University of Paris and graduated M.B., Ch.B. in 1931. Ten years later he took the D.P.H. of the University of London. He held [illegible] posts of resident medical officer at the West Hospital, Balham, and at the City of Leicester Isolation Hospital and [illegible] assistant medical officer of health [illegible] medical officer of the West Bromwich County Borough. At the outbreak of war he was assistant county medical officer of the Norfolk County Council and medical officer of health of the [illegible] Rural Districts and the [illegible] Rural District. He joined the British Medical Association in 1937 and was a Fellow of the Society of Medical Officers of Health. He contributed an article on the aetiology of impetigo contagiosa [illegible] to the Medical Officer in 1937. He was called up in September 1939 and served at R.N. Barracks, Chatham, and in H.M.S. *Berwick*.

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Surgeon Lieutenant Thomas Ivor David, M.R.C.S., L.R.C.P., R.N.V.R., was born on December 15 1911 and is reported as "Missing, presumed killed" on September [illegible] 1940. He was educated at St. Thomas's Hospital and took the M.R.C.S., L.R.C.P. in 1937. After qualifying he held the posts of resident surgeon, casualty officer and resident anaesthetist at the Kent and Sussex Hospital, Tunbridge Wells. He was mobilised while on the [illegible] Station and served at R.N. Barracks, Chatham, and in H.M.S. [illegible] and H.M.S. *Dundee*.

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Probationary Temporary Surgeon Lieutenant Arthur Godfrey Bellamy, B.M., B.Ch., M.R.C.S., L.R.C.P., R.N.V.R., was born on January 12 1912 and was killed in action on September 7 1940. Dr. Bellamy was educated at the University of Cambridge and St. Thomas's Hospital and qualified M.R.C.S., L.R.C.P. in 1936. He then took the degrees of B.M., B.Ch. in 1937. He held the post of senior resident medical officer at the Royal National Hospital for Consumption, Ventnor, and at the outbreak of war was working in [illegible]. He joined the B.M.A. in April 1938. He was called up in May 1940 and during his short service career held appointments at Portsmouth Barracks and in H.M.S. *Victory* for special service, and finally to H.M.S. *Godetia*.

Temporary [illegible] Lieutenant James Gilbertson M.B. B.S. R.N.V.R. [illegible] April [illegible] killed in action on November 13, 1940. He graduated M.B. B.S. [illegible] in 1938. He was called up in 1940 [illegible] Chatham [illegible] H.M.S. *Racoon*

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[illegible] Lieutenant-Commander John Barclay Barr M.B. R.N.V.R. [illegible] 1940 [illegible] is reported as "Missing, presumed killed" [illegible] November [illegible] degrees in 1930 and on being called up in [illegible] *Jervis Bay*

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[illegible] Lieutenant Samuel [illegible] Lindsay M.B. Ch.B. R.N.V.R. [illegible] reported as "Missing, presumed killed" [illegible] 1940 [illegible] graduated M.B. Ch.B. [illegible] house surgeon at the General Infirmary [illegible] Hospital. He [illegible] November 1939 and served at [illegible] Barracks [illegible] H.M.S. [illegible]

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Surgeon [illegible] Warren R.N.V.R. was reported [illegible] 1940 [illegible] reported [illegible]

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Wardmaster [illegible] M.B.E. R.N. was born on [illegible] 1908 [illegible] R.N. Hospital [illegible] Cape Hospital [illegible] R.N.A. Hospital [illegible] Wardmaster in 19[illegible] Ward[illegible] 1935 [illegible] Ward[illegible] [illegible]

Wardmaster [illegible] M.B.E. [illegible] always [illegible] of the Sick Berth Staff from [illegible] his skill [illegible] He joined the Sick Berth Staff at Haslar [illegible] retired as a Wardmaster in September 1935. During the Great War [illegible] mentioned in despatches. He was awarded the M.B.E. on the Occasion of [illegible] King.

He was always [illegible] keen and [illegible] [illegible] outlook [illegible] [illegible] Naval [illegible] [illegible]

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[illegible] Temporary Surgeon Lieutenant [illegible] B. Walsh [illegible] R.N.V.R. [illegible] now reported [illegible]

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## HONOURS

*[illegible] Honorary Physician*

[illegible] F. C. [illegible] Griffiths D.S.O. M.R.C.S. L.R.C.P. [illegible] to be Honorary Physician to H.M. the King [illegible] 1940.

Surgeon Captain [illegible] Carr C.B.E. M.R.C.S. L.R.C.P. [illegible] R.N. to be Honorary [illegible] to H.M. the King (K.H.P.) November 8, 1940.

### *King's Honorary Surgeon*

Surgeon [illegible] B [illegible] MB ChB RAN [illegible] to [illegible] H M The King [illegible] November 8 1949

### *C B (Military)*

Temporary Surgeon [illegible] C P G Wakeley FRCS [illegible] of the Order [illegible]

### *C B E (Military)*

Surgeon Captain [illegible] Cory MRCS LRCP RN [illegible] Order of the British Empire (CBE)

### *O B E*

Surgeon Commander [illegible] A W North LMSSA RN to be [illegible] British Empire (Military Division)

Surgeon Commander [illegible] A A Pomfret MB ChB [illegible] DOMS [illegible] of the Order of the British Empire (Military Division)

Surgeon [illegible] Commander W Mell MacGregor MB [illegible] RNVR to be [illegible] Officer of the Military [illegible] British Empire (OBE) for distinguished services with the [illegible]

### *D S C*

The Distinguished Service Cross has been awarded to Surgeon [illegible] RN and to Surgeon Lieutenant Thomas Beaumont [illegible] RNVR also to Temporary Surgeon Lieutenant Commander William [illegible] Miller RNVR for gallantry and [illegible] in operations in [illegible]

### *Mentioned in Despatches*

Surgeon [illegible] A W G[illegible] MVO RN HMS [illegible] [illegible] Temporary Surgeon [illegible] William P[illegible] RNVR [illegible] Temporary Surgeon Lieutenant [illegible] MacLean RCNVR HMS [illegible] RNVR [illegible] Commander [illegible] RNVR

## RETIREMENTS ETC

Surgeon [illegible] Cresser MB BCh DTM&H [illegible] placed on the [illegible] 2 1949

Surgeon Captain E MacEwan OBE MRCS LRCP placed on the retired list [illegible] September 16 1949 (to remain in present appointment)

Surgeon Commander G B Cockun MRCS LRCP placed on the [illegible] with rank of Surgeon Captain November [illegible] (to remain in present appointment as Surgeon Commander)

Surgeon Lieutenant W F Virat MRCS LRCP withdrawn on [illegible] Service engagement and transferred to Emergency List September 21 1949 (to remain in present appointment)

Surgeon Lieutenant D W Pratt MB ChB withdrawn on [illegible] Service engagement and transferred to Emergency List October [illegible] 1949 [illegible] present appointment)

## PROMOTIONS

Surgeon Captain W Bradbury CBE DSO MB BCh to be Surgeon Rear Admiral December [illegible] 1949

Surgeon Commanders A C Shaw and H A Brown to be Surgeon Captains

Surgeon Lieutenant Commander S J Suggit MB BCh to be Surgeon Commander September 9 1949

Surgeon Lieutenant Commander H [illegible] Marks LMSSA to be Surgeon Commander September 18 1949

Surgeon Lieutenant-Commander H G Wells BM BCh MRCS LRCP to be Surgeon [illegible] [illegible]er 18 1940

Surgeon Lieutenant-Commander J W L Crosbill MB ChB to be Surgeon [illegible] [illegible]

Surgeon Lieutenant-Commander (D) P S Turner LDS granted acting rank of Surgeon Commander (D) January 1 1941

Surgeon Lieutenant-Commander G E L Reeve LDS granted acting rank of Surgeon Commander (D) August 28 1940

Surgeon Lieutenant-Commander (D) L A Moules LDS granted acting rank of Surgeon Commander (D) September 10 1940

Surgeon Lieutenant-Commander (D) H V Bell LDS granted acting rank of Surgeon Commander (D) November 16 1940

Surgeon Lieutenant-Commander (D) R J M Andrews LDS granted acting rank of Surgeon Commander (D) November 6 1940

Surgeon Lieutenant-Commander (D) H E Rose LDS granted acting rank of Surgeon Commander (D) November 21 1940

Surgeon Lieutenant [illegible] Wilson MB ChB to be Surgeon Lieutenant-Commander October [illegible] 1940

Surgeon Lieutenant [illegible] Simpson MB ChB to be Surgeon Lieutenant-Commander September 21 1940

Surgeon Lieutenant A J Glazebrook MRCS LRCP to be Surgeon Lieutenant-Commander September 20 1940

Surgeon Lieutenant H G Sylvester MRCS LRCP to be Surgeon Lieutenant-Commander October 25 1940

Surgeon Lieutenant (D) W L Walton LDS to be Surgeon Lieutenant-Commander December 3 1940

Surgeon Lieutenant (Emergency List) B O'Connor MB to be Surgeon Lieutenant-Commander (Emergency) September 10 1940

Surgeon Lieutenants (Emergency List) F D Caldwell MB ChB and R M Kirkwood MRCS LRCP to be Surgeon Lieutenant-Commanders (Emergency) September 20 1940

Surgeon Lieutenant (Emergency) D W Pratt MB BCh to be Surgeon Lieutenant-Commander (Emergency) October 2 1940

Surgeon Lieutenant (D) F L Terris LDS to be Surgeon Lieutenant-Commander (D) September 16 1940

## TRANSFERS TO PERMANENT LIST

Surgeon Lieutenant-Commander (Emergency) F D Caldwell MB ChB Surgeon Lieutenants F W Baskerville LMSSA W H C M Hamilton MB ChB J F T Wellwood MB BCh B M Goldsworthy MB S Myles MB ChB W S Miller MB ChB T A Turnbull MRCS LRCP R Ridgeway MB ChB and C J Roberts LMSSA

## WARDMASTERS

Acting Warrant Wardmaster H A G Phipps confirmed in rank November 15 1939

SBCPO W E Saunders to be Acting Warrant Wardmaster December 2 1940

SBCPO E S Tyler to be Acting Warrant Wardmaster December 2 1939

## ROYAL NAVAL VOLUNTEER RESERVE

### RETIREMENTS AND RESIGNATIONS

Temporary Surgeon Lieutenant-Commander G L Bell appointment and commission terminated October 14 1940

Surgeon Lieutenant W Miles appointment and commission terminated (medically unfit) July 20 1940

Surgeon Lieutenant A G S Hill appointment and commission [illegible] November 1940

Temporary Surgeon Lieutenant G L Lewis M B B Ch appointment and temporary commission [illegible] November 5 1940

Temporary Surgeon Lieutenant A G C Mason appointment and temporary commission terminated [illegible] September 5 1940

Probationary Temporary Surgeon Lieutenant A Greenhalgh appointment terminated (medically) [illegible] August [illegible] 1940

Probationary Temporary Surgeon Lieutenant D K Bradley appointment terminated (medically) [illegible] November 16 1940

Probationary Temporary Surgeon Lieutenant J E Wilkes appointment terminated (medically) [illegible] September 28 1940

Probationary Temporary Surgeon Lieutenant T J Pugh appointment terminated (medically) [illegible] October [illegible] 1940

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## PROMOTIONS

Acting Surgeon Lieutenant Commander T H P[illegible] to be Surgeon Lieutenant Commander July 18 1940

Acting Surgeon Lieutenant Commander G I [illegible] to be Surgeon Lieutenant Commander [illegible] 2 1940

Temporary Surgeon Lieutenant A S Nicol [illegible] granted acting rank of Temporary Surgeon Lieutenant Commander September 27 1940

Probationary Surgeon Lieutenant (D) P A Crow confirmed in rank [illegible] 1940

Probationary Surgeon Lieutenant J B[illegible] confirmed in rank July 14 1940

Probationary Surgeon Lieutenant I G W [illegible] confirmed in rank August 3 1940

Probationary Surgeon Lieutenant H F Rutherford confirmed in rank March 11 1940

Probationary Surgeon Lieutenant D M Sheppard confirmed in rank May 21 1940

Probationary Surgeon Lieutenant N Bexell confirmed in rank August 3 1940

Probationary Surgeon Lieutenant G R Laing confirmed in rank May 25 1940

Probationary Surgeon Lieutenant H W Gethard confirmed in rank July 11 1940

Probationary Temporary Surgeon Lieutenant H M McEwan confirmed in rank March 13 1940

Probationary Temporary Surgeon Lieutenant J A Riddrop M B Ch B granted acting rank of Temporary Surgeon Lieutenant Commander September 1[illegible] 1940

Probationary Temporary Surgeon Lieutenant E P K Kilvert confirmed in rank February 2 1940

Probationary Temporary Surgeon Lieutenant J R Santon confirmed in rank February 13 1940

Probationary Temporary Surgeon Lieutenant J B Hassan M B Ch B confirmed in rank June 17 1940

Probationary Temporary Surgeon Lieutenant A S Shuttleworth M B M R C S L R C P confirmed in rank May 11 1940

Probationary Temporary Surgeon Lieutenant J I W Harris confirmed in rank July 1 1940

Probationary Temporary Surgeon Lieutenant L J Lancelot Edwards confirmed in rank March 1 1940

Probationary Temporary Surgeon Lieutenant J Gilbertson M B confirmed in rank February 20 1940

Probationary Temporary Surgeon Lieutenant J W Boland M B B Ch confirmed in rank July 15 1940

Probationary Temporary Surgeon Lieutenant W J Lloyd M R C S L R C P confirmed in rank January 26 1940

Probationary Temporary Surgeon Lieutenant F E S Hatfield M B B Ch M R C S L R C P confirmed in rank May 21 1940

Probationary Temporary Surgeon Lieutenant J Lari M B B Ch confirmed in rank May 21 1940

Probationary Temporary Surgeon Lieutenant F L Leonard M B Ch B L R C S confirmed in rank May 8 1940

Probationary Temporary Surgeon Lieutenant J B Osler confirmed in rank March 20 1940

Probationary Temporary Surgeon Lieutenant H S A Canfield confirmed in rank June 30 1940

Probationary Temporary Surgeon Lieutenant A B Holland confirmed in rank March 1 1940 [illegible] Temporary Surgeon Lieutenant D. Walker confirmed in rank, May 1, [illegible]

[illegible] Temporary Surgeon Lieutenant J. L. Hill confirmed in rank, July [illegible]

[illegible] Temporary Surgeon Lieutenant D. E. [illegible] confirmed in rank, May 1, [illegible]

## QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

### APPOINTMENTS

Superintending Sister Miss G. H. Franklin to R.N. Auxiliary Hospital, Minterne Magna, September 1940.

Superintending Sister Miss I. K. Gillanders to R.N. Hospital, Bermuda, December 1940.

Superintending Sister Miss M. E. M. Trimble to H.M. Hospital Ship *Vita*, December 1940.

Superintending Sister Miss A. M. Taylor to R.N. Hospital, Chatham (on relief).

Superintending Sister Miss I. M. Wilkinson to H.M. Hospital Ship *Vasna*, December 1940.

Acting Superintending Sister Miss N. K. Westaway to R.N. Sick Quarters, [illegible].

Acting Superintending Sister Miss M. Hudderton to R.N. Sick Quarters, Shotley, October 1940.

Acting Superintending Sister Miss H. Moor to R.N. Auxiliary Hospital, Kingseat, [illegible] 1940.

Acting Superintending Sister Miss I. Hope, A.R.R.C., to R.N. Sick Quarters, Skegness, [illegible] 1940.

Nursing Sister Miss E. N. G. Gill to R.N. Auxiliary Hospital, Minterne Magna, September 1940.

Nursing Sister Miss I. K. C[illegible] to R.N. Sick Quarters, Great Yarmouth, December 1940.

Nursing Sister Miss M. K. Moore to R.N. Sick Quarters, Grimsby, December 1940.

Nursing Sister Miss Y. A. [illegible] Tudor Somers to R.N. Hospital, Port Edgar, December 1940.

Nursing Sister Miss S. E. E. Henry to R.N. Hospital, Haslar, December 1940.

Nursing Sister Miss I. Smith to R.N. Hospital, Chatham, December 1940.

Nursing Sister Miss D. B. Harvey to R.N. Hospital, Chatham, December 1940.

Nursing Sister Miss M. B. B[illegible] to H.M. Hospital Ship *Isle of Jersey*, [illegible] 1940.

Nursing Sister Miss H. G. Dowsett to R.N. Auxiliary Hospital, Newton Abbot, [illegible] 1940.

Nursing Sister Miss V. E. M. Lowers to R.N. Auxiliary Hospital, Newton Abbot, [illegible] 1940.

### PROMOTIONS

Acting Superintending Sister Miss M. I. [illegible] to be Superintending Sister, [illegible] 1940.

Nursing Sister Miss I. K. Coleman to be Acting Superintending Sister, December 1940.

Nursing Sister Miss D. B. Harvey to be Acting Superintending Sister, December 1940.

Nursing Sister Miss Y. A. [illegible] Tudor Somers to be Acting Superintending Sister, [illegible] 1940.

Nursing Sister Miss M. B. B[illegible] to be Acting Superintending Sister, October 1940.

Nursing Sister Miss M. Hudderton to be Acting Superintending Sister, October 1940.

### RETIREMENTS AND RESIGNATIONS

Acting Superintending Sister Miss M. J. Roberts, A.R.R.C., superannuated December 1, 1940.

Superintending Sister Miss E. K. Cheetham superannuated October 18, 1940 (in consequence of appointment at R.N. College, Dartmouth).

Nursing Sister Miss K. A. Finlay resigned September [illegible], 1940.

# Notices.

In [illegible] of the H[illegible] Society [illegible] Buckston Browne [illegible]

The [illegible] of [illegible]

[illegible] must be sent to the Hon. Treasurer [illegible] Street, [illegible] London, W.1, by October [illegible]

The prize consists of a medal and £100 [illegible] British Commonwealth of Nations.

## WELLCOME [illegible] REFINED TETANUS AND [illegible] ANTITOXIN GLOBULINS

Most [illegible] Wellcome [illegible]

[illegible]

## WELLCOME [illegible] BRAND DELAY INSULIN

[illegible] Wellcome [illegible] sugar [illegible]

◆

# Notice.

The Editors invite Medical Officers to send Articles, Original Papers on professional subjects, Travel, personal experiences, etc. Items of news and matters of interest to the Naval Medical Service will be welcome from ships and establishments at home and foreign stations.

All Articles or Communications published in the Journal of the Royal Naval Medical Service will become the property of the Journal, and will [illegible] copyright purposes, unless the author declares [illegible] Article that he desires to reserve the copyright to himself.

Notices of Births, Marriages and Deaths are inserted free of charge to subscribers.

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# Journal
# of the
# Royal Naval Medical Service.

## Articles

### SEA SURGEONS

By Surgeon Commander R. S. Allison, M.D., F.R.C.P., R.N.V.R.

He and his mate [illegible] are both exempted from all duty but to attend the [illegible]

### Errata

On page 64 of the January 1941 number the authorship of the article "Vitamin C in Collective Feeding" was incorrectly subscribed. The correct subscription should read as follows:

By S. S. Zilva, D.Sc., Ph.D., F.I.C.

*(The Division of Nutrition, Lister Institute, London)*

They held no [illegible] rank only, and while their names appeared in the ship's books with those of the boatswain, the gunner and the carpenter, they drew less pay than these worthies and received infinitely less thanks. They combined the duties of physician and surgeon with those of barber. Handicapped by lack of knowledge they fought desperately against the sea diseases, tending the sick with their own hands and moving constantly among them. In the dark interior of the ship's hold they practised their surgical art and often obtained such results as would compare favourably with modern standards. They were little known except possibly by their recognized tendency to drunkenness and debauchery. But though these weaknesses must be admitted it should not be forgotten that they were characteristic of a time and part of all the moral life of the period. Many of the surgeons and their mates were conscientious men and earned such a good report by their humanity and

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### SEA SURGEONS.

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> He and his mates are to be exempted from all duties but to attend to the sick, and cure the wounded; [illegible] must be [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] and [illegible] of the company, [illegible] [illegible] [illegible] men.
>
> (SIR WILLIAM MONSON'S *Naval Tracts*.)

The sea surgeons were the surgeons and surgeons' mates who served both in the ships of the Royal Navy and of the Merchant Service from early days until the end of the eighteenth century. They were the predecessors of the commissioned naval medical officer, their modern prototype, which was not evolved until the nineteenth century. They wore no special uniform. They held warrant rank only, and while their names appeared in the ship's books with those of the boatswain, the gunner and the carpenter, they drew less pay than these warrant officers and received infinitely less thanks. They combined the duties of physician and surgeon with those of barber. Handicapped by lack of knowledge, they fought desperately against the sea diseases, tending the sick with their own hands and moving constantly among them. In the dark interior of the ship's hold they practised their surgical art and often obtained such results as would compare favourably with modern standards. They were little known except possibly by their recognized tendency to drunkenness and debauchery. But though these weaknesses must be admitted, it should not be forgotten that they were characteristic of certain aspects of the naval life of the period. Many of the surgeons and their mates were conscientious men and earned such a good reputation [illegible]

# Notice.

The [illegible] d Officers to s[illegible] profes[illegible] personal exper[illegible] and n[illegible] Naval Medical [illegible] from [illegible] a different [illegible]

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## Articles

### SEA SURGEONS

By [illegible] R. S. ALLISON, M.D., F.R.C.P., R.N.V.R.

> [illegible]

[illegible] would [illegible] well [illegible]

W[illegible] is [illegible] and think that they [illegible]

[illegible] from the practice of carrying [illegible] the Royal Navy was first introduced Probably it [illegible] Turnbull whose History of the Naval Medical Service [illegible] notes in the original taken from the Admiralty Secretary's Minute Book the Minutes of the Barber Surgeons and of the Apothecaries Company &c believes that as early as 1512 there was an organized Naval Medical Service He bases this view, among other things upon the Cotton Ms Galba B III f 164 in the possession of the British Museum This shows that at this time, there were relative ranks among the surgeons in the Navy and appropriate scales of pay The following is an extract —

> Item to the Chif Sirurgyon by the monethe xiij s iiij d and to iiij other Surgions heyng most expert to be namyd by the Admyrall by the monethe x s and to all the other Sirurgions by the monethe viij s This Wages to be by you payde the xth day of Apryle

The spelling of the word "surgeon" is interesting In the sixteenth century the words appears to have been written either as "Sirurgyon" "Surgion" or "Sirurgion" In the seventeenth century "Chyrurgeon" was frequently used Not until the eighteenth century did the spelling "Surgeon" become general

Henry VIII established the Navy Board which looked after the medical requirements of the Fleet in peace time in addition to its other duties When a war broke out a Board of Commissioners for Sick and Wounded Seamen was set up and for the time being until the restoration of peace this body was responsible for the administration of medical affairs The selection and the responsibility for the supply of suitable surgeons and surgeon's mates was vested in the Company of Barber Surgeons This powerful company which had been granted a Royal Charter by Henry VIII was the first authority to have a governing interest in the appointment of surgeons to the Navy According to Turnbull during the Commonwealth and in the reign of William and Mary the Company had the monopoly of all the medical appointments in the Fleet in its hands and it seems to have discharged its duties very efficiently Among its many privileges was that of examination of all candidates for entry and supervision of the contents of the medical chests an authority granted to it by Letters Patent in the fifth year of Charles I John Woodall it will be remembered was at one time Master of the Com

---

[1] This authority's work [?] on the history and development of the naval medical officer is the source of many of the statements and references made in this article

pers [illegible] had been appointed [illegible] the surgeons and surgeons [illegible] carry [illegible] the Navy Board took over the actual appointment [illegible] responsible for issuing of the necessary warrants [illegible] the candidates should first have passed the examination [illegible] Surgeons Hall. This reduced the authority of the Barber Surgeons [illegible] some extent for though a young surgeon might satisfy his professional examiners there was no guarantee that he would be accepted for service. Nevertheless the Company of Barber Surgeons continued to play an important rôle in the affairs of the Naval Medical Service until the year 1797 when it was finally dissolved. This event followed upon the separation of the Barbers from the Surgeons in 1745 and upon the death of one of its governors in the former year. In consequence the Naval authorities ceased to rely further upon the Company and from that date the examination of candidates and the issue of warrants was taken over by the Commissioners for the Sick and Wounded.

The conditions of life on board ship and the remuneration in the sixteenth and the greater part of the seventeenth centuries, were not sufficient inducement to ensure a steady flow of new entries. In times of war more certain methods of recruitment had to be resorted to—namely impressment, and the Company of Barber Surgeons received the necessary authority to do this from the Privy Council. During Elizabethan times for example they probably prest a number of surgeons for the Fleet and in 1626 they also did so, as testified by Woodall— In July 1626 there were rumours of wars and our Company of Barber Surgeons were then commanded by His Majesties Authority forthwith to provide sixteen of the best surgeons as then afforded for his Majesties whole service by Land and Sea. The year 1665 was another occasion when surgeons had to be prest and the exact text of the Order in Council dated April 19 is given by Turnbull as follows —

Whereas we are informed that notwithstanding your Care and dilligence in Providing Chirurgeons for his Majesties Service those numbers prove insufficient for the present necessity thereof according to ye former custome these are therefore to Will & require you the Master, Wardens & Governours of ye Company of Barber Chirurgeons forthwith to Impress & take up for his Majesties Service soe many of the best ablest & Most Experienced Chirurgeons Mates and Barbers as shal be requisite.

In 1692 the Company petitioned that their authority for impressing surgeons should be transferred from the Privy Council to the Lord High Admiral but about the same time the practice of obtaining surgeons by impressment was discontinued. This was because the conditions under which the surgeons worked were improving and more volunteers were coming forward. The monthly pay of surgeons had been raised from 19s 4d the short [illegible] 30s. In addition there [illegible] month for every man in the ship's company, excepting the commissioned and marine officers and supernumeraries. For every [illegible] treated and cured the surgeon received 15s. and [illegible] a grant of £40 made on entry towards the furnishing of [illegible] and instruments. Another allowance on the part of [illegible] great was permission to the surgeons in the fleet to [illegible] (1691) and more important still, some provision [illegible] families of those who were killed in battle. Fifty pounds [illegible] of a surgeon of a first, second or third rate, £40 [illegible] fourth rate, and £25 and £20 respectively to the relatives of [illegible] fifth and sixth rate.

In the year 1730 the regular monthly pay of a surgeon [illegible] according to the rate of ship he served in, and [illegible] ranged from £2 10s. to £4 10s. per month. No great [illegible] in pay was made after this until the year [illegible] except for Queen Anne's Bounty. This bounty or free gift was [illegible] of assisting the surgeons to buy the necessary drugs and [illegible] with which to conduct their practice on board ship. [illegible] expected to purchase these themselves, and to provide [illegible] would satisfy the examiners of the Company of Barber Surgeons or the Physician of Greenwich Hospital. Queen Anne's Bounty [illegible] the ship and the number of the crew, but in time of war [illegible] carrying some 600 men it amounted to over £40 a year.

The young surgeons' mates possessed only a rude education [illegible] part of the eighteenth century, when the Service seems to have been [illegible] popular; they were mostly impecunious Scotsmen, who thronged the Navy Office seeking appointments. Many of these had no other experience of medicine or surgery than could be obtained by acting for a few years as apprentice or unqualified assistant to doctors in practice ashore. Tobias Smollett, himself a Scotsman, served as surgeon's mate on board H.M.S. *Cumberland* and made a voyage to the West Indies in her [3]. He immortalized his experiences in "Roderick Random," and in this spirited novel we have a mirror of the conditions afloat, especially as seen through the eyes of the surgeon's mate. Smollett has often been taxed with overdrawing and caricaturing the picture of life in the Royal Navy at the period, but he was a medical man and he had the advantage of first-hand experience.

Some such exhortation as the following must have been responsible for many young men taking up the calling of surgeon's mate: "I am surprised that a young fellow like you discovers no inclination to push his fortune in the world. Before I was of your age I was broiling on the Coast of Guinea.

Damme! what's to hinder you from going to the war which will certainly be declared in a short time against Spain? You may easily get on board a King's ship in quality of a surgeon's mate, where you will certainly see a great deal of practice, and stand a good chance of getting prize money.

Roderick Random, however, found that it was not so easy to enter the Navy as it had been represented to him. He learnt to his dismay that it was necessary for him to pass an examination at the Surgeons' Hall before he could be accepted by the Navy Office.

I preserved my half guinea entire till the day of examination, when I went with a quaking heart to Surgeons' Hall, in order to undergo that ceremony ... a young fellow came out from the place of examination with a pale countenance, his lip quivering, and his looks as wild as if he had seen a ghost. He no sooner appeared, than we all flocked about him with the utmost eagerness to know what reception he had met with; which, after some pause, he described, recounting all the questions they had asked, and the answers he made ... At length the beadle called my name ... I was conducted into a large hall, where I saw about a dozen of grim faces sitting at a long table; one of whom bade me come forward, in such an imperious tone, that I was actually for a minute or two bereft of my senses. The first question he put to me was, "Where was you born?" To which I answered, "In Scotland." "In Scotland," said he; "I know that very well, we have scarce any other countrymen to examine here; you Scotchmen have overspread us of late as the locusts did Egypt ..." He then proceeded to interrogate me about my age, the town where I served my time, with the term of my apprenticeship; and when I informed him that I served three years only, he fell into a violent passion; swore it was a shame and a scandal to send such raw boys into the world as surgeons ... I was scarce able to stand; which being perceived by a plump gentleman who sat opposite to me, with a skull before him, he said ... "you need not be afraid" ... then he gave me time to recollect myself. He examined me touching the operation of the trepan, and was very well satisfied with my answers.

Roderick Random succeeded in passing the examiners, and received his qualification as a surgeon, for which he was required to pay five shillings. He remarks ruefully, "I was afterwards to give three shillings and sixpence to the beadle, and a shilling to an old woman who swept the hall." Even then he was not out of his difficulties, because when he repaired to the Navy Office the next morning and found himself qualified to act as second surgeon's mate on a third rate, the secretary simply filed his application and informed him that there were no vacancies. He was invited to join some of the other applicants to provide a bribe for the secretary, but having no ready cash he was unable to do so. Apparently a bribe was necessary because, on the young man had told him that after he had [illegible] Navy Office many months for a warrant to no purpose he was [illegible] one of his clothes which raised a small sum wherewith he bribed the secretary who soon procured a warrant for him notwithstanding he had affirmed the same day that there was not one vacancy.

In 1709 the young surgeon's mate was required to pass an additional examination on entry in medicine. This was conducted by the Physician of the Sick and Wounded Board but in 1715 on the return of peace the examination was taken over by the physician of Greenwich Hospital. The latter was also assigned the duty of inspecting the surgeons' medical journals on their return from their voyages. The importance of keeping adequate records seems to have been thoroughly appreciated by the Barber Surgeons as shown by the resolution they passed on February 1 1731. This has been extracted from their minutes by Turnbull. It marks probably the first authoritative step in initiating a practice which has continued in the Royal Navy to the present day. It reads as follows: That all extraordinary cases in surgery described in the Sea Surgeons' Journals that should be delivered to the Governors of the Company for the time being should be marked by the Governor from time to time and that such cases should be copied into a book and they and all other remarkable cases that should happen at home and abroad and be reported and communicated to the Governors or Examiners of the Company should be laid before the Court of Examiners from time to time for their opinion and direction whether the same should be published or not and in what manner at the expense of the Company.

The College of Physicians had relatively little to do with the affairs of the Naval Medical Service compared with the Barber Surgeons and the Company of Apothecaries. There was considerable difference of course in the social and professional status of these three bodies and their practice and scope were confined within rigorous bounds. The physicians ranked first by reason of their traditional right and greater learning. Their college was founded in the year 1518 by Linacre just twenty-two years before the union of the Barbers Company with the Guild of Surgeons. It excluded surgeons from giving medicines destined for internal use or from engaging in general practice and in the City of London surgeons were not permitted to perform an operation upon a patient except in the presence of a physician. While the Company of Barber Surgeons was in constant demand to supply the rank and file of surgeons and surgeon's mates the Navy Board or the Privy Council approached the College of Physicians less often. Then they would request them to nominate not to impress suitable men of learning as physicians to the Fleet. No physicians were ever impressed as such and from the very beginning of the Naval Medical Service their rank and pay were better than those of the surgeons. An appeal was addressed to the

College of Physicians [illegible] resulted in Dr [illegible] being appointed Physician to the Navy. Another occasion was in the year 1691 as the following extract from the Admiralty Secretary's Minute Book shows:

25.3.1691 Resolved that the Board write to the College of Physicians to nominate some able Physicians to go to sea with the Fleet with the allowance of twenty shillings a day & some to be allowed at the severall Ports at £200 a year.

As a result of this action six physicians were appointed: Dr Butts and Dr Brown to the Fleet, Dr Spencer to be stationed at Rochester, Dr Adison at Portsmouth, Dr Manlies at Plymouth and Dr Gelsthorpe at Deal. The physicians appointed to the Navy in the seventeenth and eighteenth centuries acted chiefly as fleet medical officers. They were under the orders of the Admiral or Commander-in-Chief. They lived either in the flagship or in the hospital ship and they supervised the general work of the surgeons in the different ships, acting as consultants and examining sick returns and stores. In this way their duties corresponded very closely to those of Deputy Inspector Generals and Inspector Generals in the nineteenth century and to the higher ranks such as those of Surgeon Captain and Surgeon Rear Admiral in the Service to-day. The principal difference was that while the latter had to rise by promotion from the lower rank the former could be appointed direct after nomination by the College of Physicians. Of the most distinguished physicians in the Naval Medical Service, Gilbert, Cockburn and Blane attained their position by appointment or through private influence. Lind and Trotter had the honour of reaching their high rank by the ordinary ladder of promotion after serving first at sea as surgeon. The successful labours of these physicians to improve the health of the seamen and to better the condition of their brother medical officers forms an important chapter in naval medical history of which the Colleges of London and Edinburgh may be justly proud.

The Apothecaries, at first allied to the grocers, succeeded in the year 1617 in obtaining for themselves a separate charter and, armed with this licence to dispense drugs, they soon became a powerful body challenging the ascendency of the other two bodies and especially that of the physicians. Thomas Dover was only expressing the general opinion when he railed against the high charges they made for drugs, but how much his indignation was due to genuine concern and how much to jealousy must be open to doubt. The apothecaries trespassed on the ground of the physicians by treating patients, at first secretly but later in the eighteenth century openly. Physicians in the seventeenth century had half a guinea or a guinea for a consultation and they were directed by their College to treat the necessitous poor of London free of all charge. For a long illness the apothecary's bill for drugs might easily exceed a hundred pounds, and sums such as 4s. are mentioned as charges for a glass of chalybeate wine or iron tonic, and 3s. for a single dose of purging medicine [4]. In 1703 the Company of Apothecaries obtained the monopoly of supplying all drugs to the Navy, and they opened a special shop or warehouse at which the surgeons on obtaining an appointment to a ship might purchase their medical stores. This was accounted a hardship by the surgeons, for though the Company declared their stock to be the finest obtainable and their prices reasonable, the surgeons alleged that they could buy cheaper and better drugs elsewhere. Many were the complaints raised, and there was probably a foundation of truth in them. It was said, for example, that the Apothecaries bought Jesuit's Bark[1] at 3d. and sold it to the surgeons at 20s. Another cause of dissatisfaction was that when a voyage ended sooner than had been expected, and the surgeon returned his drugs to store, he could not obtain the price he had paid, but was forced to accept a lesser sum in exchange for them. The case of one surgeon in particular is mentioned by Turnbull. His pay and the expenses he had incurred whilst surgeon to the *Edgar* between May 24, 1779 and January 11, 1781 are set out as follows:—

| | | £ s. d. |
|---|---|---|
| Total of Pay and Perquisites | | 302 12 8½ |
| Total Expenses for the period | | 148 15 10½ |
| Note.—Instruments | £17 0 6 | |
| Drugs | £56 2 0 | |
| Net income for 1 year and 8 months | | £153 16 10 |

What tradesman does not make more money and enjoy more comfort than does the surgeon dolefully—one Robert Robertson. The year 1804 saw the end of the monopoly held by the Apothecaries. From thence onwards the Admiralty took over the duty of supplying the drugs at the public expense. In doing so they removed an unjust burden which should never have been placed upon the surgeons. At first it led to the temptation of neglecting to obtain proper supplies of drugs, or to the practice of other deceits. Then when they were forced to obtain their drugs through the Apothecary's Company and had to conform to certain specifications, it led to their exploitation, a conscientious surgeon like that of the *Edgar* having to expend almost half his income to provide himself with the necessities with which to practise his profession.

Diverse are the pictures drawn of the character of the sea surgeons. It has already been said that while many were lazy, drunken and debauched some were good men who deserved a better [illegible] hard calling James Anthony Gardner [illegible] R N [illegible] of a cruise in H M S *Salisbury* in the year 17[illegible] assistant surgeon was another wet soul and [illegible] went to sleep in an empty cask that was lying on [illegible] Wh[illegible] squall of wind rolled the cask overboard and [illegible] Arthur Rearth[illegible] have been drowned had it not been for the [illegible] of the cutter Old Andrew is now dead He dearly loved grog and when told that new rum was a bad article he said he didn't care if it fractured the [illegible] it was all he wanted From Gardener's account it is evident that the second assistant surgeon was no exception drunkenness was the order of the day in the *Salisbury* and not even the Chaplain (another wet soul) was spared this vice Gardner also sailed in the *Brunswick*, and here the surgeon was nicknamed "Bottle Belly," because of his love of food and good living A different character was presented in Dr Carroll assistant surgeon of the *Goliath* His kindly and considerate treatment of a sick lieutenant whom nobody else cared about is warmly commented upon by Gardner and he is held up as an example of a good doctor

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[1] Jesuit's Bark. Early in the seventeenth century the Countess of Chinchon, Vicereine of Peru, was cured of a fever by an infusion of Cinchona bark, a remedy well known to the natives of the country, and introduced it to Europe by the Jesuits in 1632 [4].

In the letters of Midshipman William Guido Anderson who served under Nelson at Copenhagen in 1801 and was badly wounded there are references to the treatment he had and more interesting still to a consultation which was held over his case between the surgeon of the ship and the physician [illegible] the Fleet Dr Andrew Baird[1] [6] After the action the *Bellona* Anderson's ship and others were ordered to proceed to Cork On the voyage thither he mentions they had 200 men and 21 officers taken violently ill and the ship was very sickly Another ship H M S *Defence* had buried 14 men [illegible] crew within a fortnight whilst cruising off Danzig Anderson himself was lying in the cockpit suffering from a severe contusion of the knee joint and other injuries the result of a gun blowing up during the action The surgeon (Dr Madden) told him that it would take three months for the [illegible] to heal This surgeon was apparently somewhat ineffectual [illegible] his captain for the latter took matters into his own hands and wrote a letter [illegible] Dr Baird submitting that Anderson should be put on board the hospital ship and sent to England Dr Baird came over to the *Bellona* the same day to see the patient Anderson says 'I acquainted him with the whole [illegible] business since my wounds and that I did not wish to go home in the Hospital Ship as we all expected to be ordered home shortly and then I should be losing my time[2] He examined my left knee and then very deliberately told th[illegible] to speak [illegible] only H[illegible] round and told Mr Mahlen [illegible] course [illegible] would be some time etc I [illegible] that he was surprised [illegible] could wish to send me out of the ship All that the surgeon [illegible] answer was that the captain wished me to go because I was so long ill [illegible] told the surgeon that it neither rested with him or the captain to [illegible] of the ship but entirely with the Gentleman the Physician who is present It would be needless to mention all that passed

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[1] Dr Andrew Baird later was appointed [illegible] of the Sick [illegible] Board

[2] Time spent out of the ship in hospital would count against [illegible]

After a deal of talk the Physician scratched my name off the Letter above-mentioned and concluded with making me a very handsome compliment which I of course returned He told the surgeon that he was glad to see that there were young men that wished to persevere and get on in the Service This account is of interest as showing the authority wielded by the principal medical officer or physician and as illustrating the tendency of certain commanders to override the opinion of the surgeons especially if the opinion was given without the backing of sound knowledge and judgment

The duties of the surgeon as laid down in 1731 by Admiralty Orders included Visiting the sick on board twice a day or more often as required informing the captain of the daily sick state keeping a day book of his practice and composing two journals one for diseases and the other for recording all surgical operations performed When a patient was sent ashore to sick quarters or hospital he was required to send a written account of his [illegible] along with him In action his place was in the hold of the ship where a platform was prepared for the receipt of the wounded The duties of the [illegible] of the seventeenth and eighteenth centuries were very much the same as [illegible] those of Fleet Surgeons or Surgeon Commanders in modern times

The [illegible] corresponded to the most junior ranks the surgeon [illegible] or the surgeon sub-lieutenants Their duties were exceedingly [illegible] and their living conditions were not much raised above the common [illegible] seamen The diary of James Yonge who was apprenticed to Dr [illegible] Richmond surgeon of the *Constant Warwick* bears ample proof [illegible] status and of the menial tasks they were called upon to [illegible] Yonge was under fourteen when he went to sea but he rose [illegible] in the Service so that in 1663 he was appointed surgeon of the *[illegible]* a fishery protection sloop In 1672 he was appointed surgeon [illegible] Military Hospital in Plymouth and in 1692 he was surgeon to the Dockyard at the same port In 1717 he was given the duty of embalming the body of Sir Cloudesby Shovel who had been unfortunately drowned at sea and received a fee of fifty pounds for performing this office Writing of his experiences as a surgeon's mate after his ship had been in action

Algiers he [illegible] Thus began my slavery [illegible] Barker, whose fomenting [illegible] and making [illegible] Plaisters and bleeding the Dresses was all wholly on my hands [illegible] Barkers they [illegible] to stoop to a nasty and mean employment [illegible] Chirurgeon's Mates formerly did in the Navy.

In the eighteenth century the position of the surgeon's mate was much the same. He performed the duties that the sick berth attendants have allotted to them to-day. The only difference was that he had a chance of promotion to surgeon. Smollett gives a vivid and intimate account of the life of the surgeon's mate on board ship in "Roderick Random."

The living quarters were in the cockpit on the orlop deck just above the hold. This dreary abode is described as follows: "Taking a light in his hand (he) conducted me to the place of his residence, which was a square of about six feet, surrounded with the medicine chest, that of the first mate, his own, and a board by way of table fastened to the after powder room; it was also enclosed with canvas nailed round to the beams of the ship, to screen us from the cold, as well as from the view of the midshipmen and quarter masters, who lodged within the cable tiers on each side of us."

The new surgeon's mate was quickly initiated into the daily routine. He was warned not to expect any civility, that his position in the ship was a very inferior one, that "as for the captain he is too much of a gentleman to know a surgeon's mate even by sight." The day's work commenced with mustering the sick, the latter receiving their summons through a boy who went the round of the mess decks ringing a small hand bell and, in rhymes composed for the occasion, invited all those who had sores to repair before the mast, where one of the doctor's mates attended with applications to dress them. Meanwhile the daily sick list had been made up for the surgeon so that he could present it to the captain. The description given of the scene on the quarter-deck when the latter discovered that the sick numbered sixty one men may well have been exaggerated, for it was Smollett's intention to show up the evils that existed in his time. But with an inefficient and cowardly surgeon such as the one here represented it might well have taken place. The patients were ordered to parade on the quarter deck under the eyes of the surgeon and captain. "When we appeared upon deck, the captain bade the doctor, who stood bowing at his right hand, look at these lazy lubberly sons of bitches, who were good for nothing on board but to eat the King's provision and encourage idleness in the skulkers. The surgeon grinned approbation and taking the list, began to examine the complaints of each as they could crawl to the place appointed. The first was a poor fellow just freed of a fever. Mr Mackshane (for that was the doctor's name) having felt his pulse, protested he was as well as any man in the world, and the captain delivered him over to the boatswain's mate with orders that he should receive [illegible] the gangway immediately for counterfeiting himself sick [illegible] patient to be considered laboured under a quartan ague, and being then [illegible] of health discovered no other symptoms of distemper than a pale meagre countenance and emaciated body; upon which he was declared fit for duty and turned over to the boatswain; but being resolved to disgrace the doctor, died upon the forecastle the next day during his cold fit. The third complained of a pleuritic stitch and spitting of blood, for which Dr Mackshane prescribed exercise at the pump to promote expectoration. A fourth, with much difficulty, climbed to the quarter-deck, being loaded with a monstrous ascites or dropsy, that invaded his chest so much he could scarce fetch his breath; but his disease being interpreted into fat, occasioned by idleness and excess of eating, he was ordered [illegible] to go aloft immediately [illegible] the boatswain's driver was commanded to whip him up with a cat-o'-nine-tails. On the whole, the number of the sick was reduced to less than a dozen.

In the evening again, after dinner, the surgeon's mates went round the ship and visited the patients in the sick berth or hospital. Roderick Random [illegible] I was much less surprised that people should die on board, than that any sick person should recover. Here I saw about fifty miserable distempered wretches suspended in rows, so huddled one upon another, that not more than fourteen inches space was allotted for each with his bed and bedding; and deprived of the light of day, as well as of fresh air; breathing nothing but a noisome atmosphere of the morbid steams exhaling from their own excrements and diseased bodies, and destitute of every convenience necessary for people in that helpless condition.

I could not comprehend how it was possible for the attendants to come [illegible] clinging on the inside towards the sides of the ship, in order [illegible]. Much less could I conceive how my friend Thomson [illegible] administer clysters* that were ordered for some in that [illegible] him thrust his wig in his pocket, and strip himself [illegible] then creep on all fours under the hammocks [illegible] up his bare pate between two, keep them asunder [illegible] until he had done his duty.

[illegible] the grand treatment of the sick in this [illegible] in many instances the circumstances are probably exaggerated [illegible] Smollett intended. They brought to light [illegible] lightly glossed over as necessary conditions [illegible] the public conscience, and it is noteworthy that [illegible] than James Lind's famous essay appeared, "On [illegible] Method of Preserving The Health of Seamen

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[illegible] other [illegible] the hammocks *Enemas

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# AMPUTATION OF FINGERS

By Surgeon Captain LAMBERT ROGERS, F.R.C.S., [illegible]

*Surgical [illegible]*

[illegible] generally [illegible]. It is a gross perversion [illegible] which is perfect [illegible] recommended [illegible] Wood Jones.

Amputations since the end of the last war [illegible] section of his textbook [illegible] published [illegible] associated with the names of their [illegible] Stokes-Gritti, of Stephen Smith [illegible] Chopart, Syme, Gordon and Pirogoff [illegible] historical examples. Most of these [illegible] and brought forth [illegible] since experience gained in the last [illegible] the optimum site and method of amputation [illegible] current practice and gradually found [illegible]. The result is that there has been [illegible] opinion is now practically unanimous and the [illegible] has only to familiarize himself with [illegible] relatively simple and standard character [illegible] the upper and lower limbs. The object of all amputations [illegible] the best possible end-result for the [illegible] and in the case of the limbs also [illegible] fitting of the most useful and best-looking [illegible].

While, however, it is [illegible] sites for amputation through the upper and lower limbs [illegible] done in the case of the digits. The [illegible] the case of the toes, if amputation [illegible] mental [illegible] carried out [illegible] every [illegible] the object [illegible] depicted [illegible] that such [illegible] most efficient function should be the end result to be sought, and [illegible] connection to maintain that there are optimum sites for amputation [illegible] each of the fingers just as there are for amputations either above or below the knee.

This contention has been well brought out in a recent monograph on the surgery of the hand (Couch, 1939). The author writes that a "blanket" (i.e. all covering) rule, "save all you can," has preserved the peace of mind of many a surgeon, even though it has not preserved useful function in the hand. "There is no point," he rightly tells us, "in saving fingers so badly smashed that they can never be useful. Many a patient comes back after a year of useless suffering and has a stiff, distorted finger removed. If it had been removed at first he would have been back at work in five weeks." "Most patients value their hands to grasp with, not just to look at." We should conserve function rather than form, or in other words think in terms of physiology rather than anatomy, and plan our amputations accordingly. There is one great difference between amputations through the limbs and those of digits: in the former, the level is largely determined by the question of fitting a satisfactory artificial limb and is therefore influenced by the outlook and methods of the instrument makers; in the case of the digits, however, no such consideration applies and our aim is merely to obtain the most useful hand in the shortest time.

General Principles.—Amputation through the digits may be carried out by anterior and posterior flaps or by a racquet incision, or Farabeuf's modification of this, in the case of the thumb, index and little fingers. The details of such operations are well described in textbooks of operative surgery and our object here is to consider rather the optimum level at which these amputations should be performed.

A crushing of two bones with shattering of the intervening joint is an indication for a proximal amputation, since joints which are so badly disorganized that they will become stiff are not worth preserving. Shredded or missing tendons also render a finger useless and indicate its early amputation. In the presence of infection it is unwise to cut through bone and better to disarticulate. A trimming operation can be done later if required.

Individual Digits.—*The Thumb.*—Because of its power of opposition to any one of the fingers, the thumb is the most important digit. With its loss the power of grasp is lost. Every effort must be made to conserve as much of the thumb as possible. The old anatomical rule laid down for fingers in general still applies to the thumb. Here the anatomical and physiological viewpoints are coincident.

[illegible] through [illegible]
the short stump [illegible] is not only [illegible]

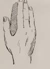

Fig. 1

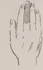

Fig. 2

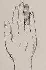

Fig. 3

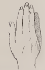

Fig. 4

Fig. 1.—If injury to the index finger [illegible] proves to [illegible] the whole finger [illegible] metacarpal, the radial side of the hand [illegible] as shown.

Figs. 2 and 3.—Amputation through the middle phalanx [illegible] interphalangeal joint is satisfactory [illegible]

Fig. 4.—Amputations at any level through [illegible] at the knuckle. If the whole finger [illegible] metacarpal bone should be taken away [illegible] as shown.

as well. The reason is that patients refuse to use the short stump and try instead to keep it out of the way while opposing the thumb to the middle finger which now takes on the work previously performed by the index. This short stump is held awkwardly in [illegible] and is [illegible] it is prone to injury. If injury to the index finger [illegible] amputation proximal to the distal interphalangeal joint [illegible] should be sacrificed and with it the head and neck of the [illegible]. If the metacarpal head is not removed a hump remains [illegible] annoyance as the patient is constantly getting it in the way [illegible] for object [illegible] points out in the case of the right [illegible] [illegible] embarrassment every time the patient shakes hands.

*Middle and Ring Fingers.*—As in the index, amputation [illegible] distal phalanx is permissible and gives good results. The short [illegible] result from amputation through the middle phalanx or disarticulation [illegible] proximal interphalangeal joint are also sound in the [illegible] [illegible] they prevent small [illegible] and [illegible] index. Furthermore they [illegible] alignment of the other digits so that these do not deviate [illegible]. At the metacarpophalangeal joint, however, amputation [illegible] and [illegible] is permitted to occur and the metacarpal head [illegible] [illegible] as follows. If the whole of one of these fingers [illegible] removed the metacarpal head and part of its shaft should be [illegible] up the hand. Contrary to what has often been [illegible] [illegible] the metacarpal head does not materially [illegible] the hand.

*Little Finger.*—Amputation through this finger may be carried out at any level where it is possible to obtain sound flaps, but disarticulation at the [illegible] it is preferable to amputate through the metacarpal shaft and [illegible] ulnar border of the hand so that no hump such as would result [illegible] the metacarpal head remains to be a source of distraction to the patient [illegible]. If disarticulation at the metacarpophalangeal joint is [illegible] a hump remains; the patient when reaching to grasp some [illegible] makes allowance for it, sufficient clearance is judged for the [illegible] itself but not for the stump formed by the head of the fifth metacarpal and it is constantly being knocked in consequence. A clean amputation of the little finger should therefore include the metacarpal head and part of the shaft.

[illegible]—If, when fingers are amputated, attention is given to these [illegible] from a consideration of subsequent function rather than [illegible] anatomical one of preserving as much as possible the [illegible] necessitated by amputation will not only be reduced but [illegible] discomfort and a necessity for further operations. Just as [illegible] recognized optimum sites for amputations through the limbs, [illegible] each digit has its optimum site at which amputation should be [illegible] of the necessary [illegible] the [illegible] the fingers [illegible] guiding dictum might well be [illegible] and it is well to remember that its converse is equally true.

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## HYSTERIA IN WAR-TIME

By Surgeon Lieutenant-Commander E. W. ANDERSON, M.D., M.R.C.P., R.N.V.R.

There are few words which have such a variety of meanings as hysteria. This is in part due to the fact that the word is not entirely medical but is also used freely and vaguely by the laity, often in the vulgarized form of 'the hysterics'. What exactly this means, like its neighbour 'brain storms', is not clear to me, although I have frequently besought intelligent laymen to define them. As far as can be ascertained through the mist of popular thinking, 'hysteria' and 'the hysterics' seem in the lay mind to consist of uncontrolled fear often amounting to panic, theatrically expressed by screaming, exaggerated movements and gestures, and imperviousness to reason, in the face of a situation of an unpleasant or even catastrophic kind. The 'victim' is usually a culturally inferior person. Attending the lay attitude is the belief or suspicion that the observer is being hoodwinked, that the sufferer could stop this exhibition if he (or usually she) 'pulled himself together'. The bystanders are both shocked and contemptuous.

Now this lay view of hysteria is unfortunately not far removed from that shared by many doctors. The hold which it has [illegible] based, however, on the fact that it is not entirely wide of the mark, and may in fact represent a healthier attitude on the part of the community to this type of abnormal reaction than that encouraged by some psychotherapists.

Broadly, three groups of phenomena are subsumed under the term hysteria:

(1) Conversion symptoms, so-called hysterical stigmata; (2) transient abnormal psychic states with alterations of consciousness; (3) the hysterical character.

The hysterical character will be described first. Many different qualities go to make up these personalities, but there are certain common factors.

According to a classical description there is one fundamental characteristic, i.e. the desire to appear before others as something greater and more significant [illegible] usually empty personality [illegible]. This may take [illegible] forms according to the [illegible] interests of the [illegible]. Many "Lady Bountiful" [illegible] charity [illegible] and apparently deeply [illegible] actuated fundamentally by motives of complete selfish[illegible] mastery over others, for the greater realization of their selfish [illegible] perhaps the desire to appear good-hearted or philanthropic, characteristic [illegible] removed from these cold and self-centred individuals. Behind this is always a *motive* and this is essential to the whole concept of hysteria. These personalities know well the blackmail value of the warmer human sentiments and attributes though they may not exploit them with conscious calculation, for their power of self-deception is great. It is clear therefore that "un-genuineness" is a cardinal feature and to disguise or offset this theatrical devices of all kinds are adopted, often with conspicuous success. This character trait need not in itself be pathological. Many a successful career at the Bar, in the Church, in the Services, not to mention the Stage, its natural venue, is due to this tendency socially controlled and canalized as the result of insight, other stabilizing factors in the personality and possibly early character training. Indeed hysterical personality must not be equated with social worthlessness. Nietzsche has mentioned the powerful motive force of vanity.

These are, however, relatively superficial features. More fundamental is a peculiarity which is primary and common to all the disorders under consideration, that is the disposition to what is known technically as "dissociation". This may show itself in all grades, from the fragmentary and trivial dissociation expressed in the affectations of speech and gesture of many essentially solid and reliable people to the extreme form of fugue and pseudo-psychosis to be described below. The hysterical personality has the power in response to the dissatisfaction in the real self of creating, elaborating, and organizing another self whose attributes are designed to deceive both the creator and his entourage. He lives this other self and ultimately becomes it, projecting it on to the stage of life for the admiration not least of its creator but not forgetting the audience without which the hysterical personality cannot exist. Their lives consist of an empty make-believe with now and then more violent demonstrations, well named in common language "scenes". In time their bluff may be called and further subterfuge exhausted. An angry and bitterly hostile attitude may then result. A wide range of morbid types has been included in the group of hysterical characters, e.g. pathological liars, swindlers, writers of anonymous letters and others. It is doubtful whether this is entirely justifiable in all cases. In everyday practice, not merely psychiatric, one of the commonest types of this personality is the well-to-do *malade imaginaire* with her tendency to gossip, intrigue, play off

[illegible]

[illegible] ristic or [illegible]

The follo[illegible]ing [illegible] nricks

Case I.—Aged [illegible] R.N.V. [illegible] Barrow Gurney [illegible] time of [illegible] His [illegible] [illegible] allegiance [illegible] written his mark [illegible] psychopathic traits [illegible] leaving school [illegible] He joined the N[illegible] vrters branch [illegible] occasional lecture [illegible] [illegible] sexuality and [illegible] the subject [illegible] literature [illegible] inverted [illegible] provincial periodicals.

Two years previously when [illegible] was preceded or precipitated [illegible] sensation in the stomach [illegible] his knees giving way abruptly [illegible] for a few minutes he was unable [illegible] went on but could not utter a [illegible] feeling lasted about five min[illegible] sisted for another half-hour [illegible] or in situations causing anxiety [illegible] precipitated an attack. He had [illegible] Later he developed a second typ[illegible] expected spasm of the arms [illegible] clutched more tightly. These [illegible] accompanied by loss of [illegible]

On examination [illegible] ence there were no gross [illegible]

Physically N.A.D. [illegible] Wassermann [illegible] in the blood [illegible] syphilitic treatment was begun.

An electro-encephalogram [illegible] reported as "only just [illegible]

During his stay in hospital [illegible] bizarre symbolism [illegible] his power of [illegible] became increasingly apparent [illegible] character with psychogenic [illegible] himself out of the Service [illegible] duty on September 18, 1940.

The hysterical character appears in the foregoing case [illegible] than usual. The grosser manifestations [illegible] more [illegible] sex. This patient shows, however, some of the features [illegible] suggestibility, untruthfulness and theatricality, as shown by his unnatural pose. The [illegible] the double purpose of attracting attention and also of [illegible] for invaliding. It must be stressed that hysterical symptoms may [illegible] apart from the setting of a hysterical personality, and that [illegible] go through life without the necessity for producing symptoms. As regards the fits, true epilepsy, cataplexy and hyperventilation tetany [illegible] considered in the differential diagnosis. The [illegible] in emotional situations and the general improvement [illegible] were more congenial, together with the negative family history and negative electro-encephalogram, speak against epilepsy. Neither were the attacks typical of the affective loss of tonus in cataplexy, and there was no evidence of hyperventilation and no true tetany.

The second case—a hysterical fugue—illustrates the phenomenon of dissociation in typical form.

Case 2.—S. P. O., aged 33, [illegible], was admitted to the Royal Naval Hospital, Barrow Gurney, on January 12, 1940. His family history was essentially negative. Personal history: Born March 12, 1907. [illegible] twice in childhood he had [illegible] illness. There is no history of psychopathic traits. He reached Standard VII at school and then [illegible] with a butcher till he was 18, when he joined the Navy, where he had a good record. He had been married [illegible] and had [illegible] children. He showed no evidence of [illegible] until [illegible] began as follows:—

He remembered his ship arriving at Liverpool about December 28, 1939. He remembers no more until he found himself in hospital [illegible] on January 3, 1940. He had no recollection of [illegible] ship [illegible] he was picked up unconscious in the street. The [illegible] discovered. On admission he said: "It seems all [illegible] understand it. [illegible]" [illegible] gradually more depressed and anxious and [illegible] unable to recover any memory of the episode. On March [illegible], 1940, [illegible] was given, and whilst under the drug he stated that after a visit [illegible] in October 1939 he [illegible] and anxious [illegible] compelled to inspect his [illegible] lest anything should [illegible] wrong. He felt later [illegible] when he arrived home in December 1939. Nevertheless he [illegible] reason why he should [illegible] off the train at this town [illegible] miles away) unless he feared his wife would [illegible]. He was very [illegible] that [illegible] child. Following this [illegible] he always called her [illegible].

[illegible] he looked [illegible] was [illegible] depressed and his appetite was poor. He [illegible]. He [illegible] his ship. He was [illegible] and his memory [illegible] apart from the blank period. He was invalided [illegible] to the Service [illegible] 20, 1940. Physically N.A.D. Wassermann reaction negative.

H[illegible] interesting [illegible]. Although he appeared [illegible] clean [illegible] it was possible [illegible] tell the whole truth. [illegible] the desire [illegible] escape from the Service [illegible] factor. The strain [illegible] service is likely to bring [illegible] hysterical tendency. This case also shows the [illegible] background. Some depressions begin with a fugue, and [illegible] depends essentially on a hysterical mechanism, the symptoms [illegible] subsequently dominate the clinical picture and are fundamental.

Wandering also occurs in [illegible] subnormal mentality, often accompanied by a real or largely spurious [illegible] for the event. In one case a nostalgic urge to escape from the rigours of Service was the explanation in an individual who by reason [illegible] was unable to weigh up the consequences of his action. It also occurs in schizophrenia and other conditions. Lastly epileptic wandering, a so-called equivalent, must be mentioned in the differential diagnosis. In these cases other evidence of epilepsy must be sought and here again the electro-encephalogram may prove of service in a doubtful case.

The last type of case to be mentioned, infrequent in civil practice, is much commoner under war-time conditions: the so-called pseudo-dementia and the much rarer Ganser syndrome.

Hysterical pseudo-dementia, associated with the name of Wernicke, is characterized by a gross loss of the most elementary knowledge. Patients may profess to be unable to say how many days there are in the week, where they went to school and so on. The answers are usually approximate, e.g. they may say there are eight days in the week or perhaps six, 2 + 2 [illegible] (or one less) and so on. This is given with an ungenuine air as a rule [illegible] instantly arouses suspicion. It is more difficult perhaps in these states than in any other hysterical reactions to assess the degree of conscious perception, and in most cases of pseudo-dementia some degree of this must be [illegible] assumed. Disciplinary measures do not usually prove helpful and [illegible] condition is evidence of a severe psychopathic deviation, invaliding is usually the only course. The other syndrome, described first by Ganser, consists of a severe disturbance of consciousness often with hallucinations. The unconscious element in the production of symptoms is much more manifest. Here again the answers are approximate. The condition [illegible] observed as a reaction to detention in prisoners, but is also seen in non-criminal cases. The condition is rare [illegible] seen [illegible] at the R.N.A. Hospital, Barrow Gurney.

Case I.—A.B., [illegible] H[illegible] history of his past life. He was admitted to hospital [illegible] 1940 from [illegible]. The M.O. there said he had [illegible] morning, shivering. His temperature was 10[illegible] but his pulse [illegible]

[illegible] these symptoms. [illegible] His cerebrospinal fluid was negative. [illegible]

[illegible] His state varied at different times. [illegible] professed [illegible] in time and space. It was stated that [illegible] *Hardy* [illegible] and that his condition had begun shortly afterwards. [illegible] August [illegible] pentothal intravenously during which [illegible] Water [illegible] bombs. The following day [illegible] appeared [illegible] amnesia was detected. On August 8 10 c.c. pentothal [illegible] and the patient described [illegible] experience [illegible] following an accident to another ship in [illegible] Another 10 [illegible] pentothal was given a few days later but with no further result. He had a complete amnesia for the *Hardy* experience. He showed no essential change until towards the end of August when his vocabulary became limited. He claimed to be unable to read or write but could copy. On August 24, 1940, he was reported as having increasing difficulty in speech. He appeared to be searching for suitable words. He was sent out on twenty-one days leave. On return there was little change. He claimed to have forgotten his childhood and early life, but could remember all he did whilst on leave. He was referred to the R.N.A.H., Barrow Gurney, on September 3, 1940. Asked the trouble, he replied: "I don't think there's any trouble." He smiled faintly as he related this, but on being questioned he repudiated firmly that he was amused. The following typical conversation occurred:—

| | |
|---|---|
| When did this trouble start? | I do not know, Sir. |
| How long in the Navy? | Perhaps eleven years. |
| Date of joining? | No reply. |
| Were you at Shotley? | I don't know the name Shotley, Sir. |
| When were you born? (Question repeated.) | I've been trying to tell you the date. (Sighed.) |
| Been in action? | I don't think so, not in action. |
| When married? | That I could not tell you. |
| How many years? | I think it would be perhaps four years. I got an only baby. |
| Where do you live? | [illegible] |
| [illegible] there? | I could not say [illegible] the [illegible] I [illegible] the place, but cannot get [illegible] |
| [illegible] birth? | I [illegible] think I [illegible] My mother [illegible] I just forget. [illegible] I think [illegible] perhaps it will [illegible] back in time. |

He claimed also to be [illegible] characteristically [illegible] When asked his full name, he replied with hesitation [illegible] great difficulty [illegible] he gave his full name. [illegible] 8 + 7 = 13. He failed to repeat five digits [illegible] defect [illegible] He professed to be unable to read and write. The whole impression [illegible] and the examiner felt the patient was laughing up his sleeve the whole time. Physically nothing abnormal was found in any system. Wassermann reaction negative. He was later invalided. His condition then showed [illegible]

This is a classical case. In the dialogue recorded, the stilted nature of the utterance, like an amateur with an imperfectly mastered script, the approxi [illegible] of the answers perhaps eleven [illegible] [illegible] of the kind in themselves suggest the diagnosis to the expert. Where in addition recent memory is perfectly retained with alleged total [illegible] [illegible] the diagnosis is clinched. This can only occur in hysteria. Special [illegible] mention of the differential diagnosis between this and the organic syndromes but in organic syndromes there is not the same loss of the most elementary knowledge. As mentioned it is difficult to say to what degree conscious malingering is present in these cases. It is often a matter of opinion. Nevertheless the beginner would make a fundamental mistake if he regarded these cases as other than medical problems to be dealt with on medical grounds. A severe "hysterical" psychopathic disposition could be assumed in this case which would have hindered him from becoming an efficient rating and survey and invaliding was the only course.

The three cases already described are fairly typical of our cases of hysteria. The fact that hysterical symptoms can be so easily suggested is of the utmost practical importance and the greatest care must be taken to avoid producing symptoms in this manner. With a pseudo-dementia crude questions as to orientation memory &c should be avoided and such information obtained subtly and obliquely. The formal nature of these questions whilst often in place with an organic patient is not suited to the hysteric. Even in questioning an organic patient and this applies to all psychiatric examination the avoidance of the creation of an artificial test situation must be avoided. The cue to a malingerer is too obvious to require stress. The hysteric is more than usually suggestible.

This paper will be concluded with some general remarks on hysteria. It has been said we are all capable of hysteria. This is particularly important to bear in mind in time of war. Intense fear produced by sudden and unexpected enemy activity may evoke a primitive reaction possibly stupor fugue or other hysterical manifestation in a person who in normal life showed no trace of hysterical behaviour and might never do so again. In this respect hysteria is the most universal mental disorder. Much however depends on the attitude of the environment—a firm but understanding discipline is one of the best prophylactics. The level of culture and degree of training are also important factors in prevention.

Hysterical manifestations may be broadly grouped for immediate practical purposes as follows. First there is the out and out hysterical psychopath whose whole life is one long false response to the demands made by society upon him. Second there are the hysterical reactions in the setting of other mental illnesses released or unmasked by the basic disorder e g a depression. Lastly there are the occasional hysterical phenomena which might be shown by fairly stable people in times of severe stress. The treatment of all three is different. With regard to the first the sooner the Service is rid of them the better. The [illegible] of the second group depends on that of the basic illness and is [illegible] usually of that. Where a rapid recovery takes place with disappearance of the hysterical symptoms, return to duty might be considered. The prognosis is much more that of the basic illness than of the hysterical symptoms. Treatment of the third group depends largely on wise handling at the time.

There is no reason why the ship's medical officer, even if he has had no psychiatric training, should not deal effectively with the simpler cases. A primary responsibility devolves on him in this, for he may be the means of preventing a recurrence and the establishing of a lasting hysterical response to crises ending in the loss of a man to the Service. Admission to hospital is usually best avoided in many such cases.

With regard to special methods of treatment in hospital, the use of sodium amytal, pentothal and similar drugs has been mentioned already. This has already been described in these columns by Mallinson.

In conclusion it has been seen that the question of "motive" is inseparable from the concept of hysteria. The patient is usually only partially aware of this, but the degree of unawareness varies. In war-time practice the motive is nearly always the desire to escape from Service. The mechanism of dissociation is readily available to the hysteric or, under stress, can become so.

In this paper it has been sought to show that this mechanism of dissociation is fundamental to all forms of hysteria and that it is also an integral part of the hysterical character. Examples have been shown in all three cases. Much has been made in the past of that attitude which has been aptly described "defective health conscience." Certainly it is a prominent feature in most hysterics. Sickness is one of the most certain means of attracting notice and sympathy in our civilization. However, although a common feature in hysteria, it is not essential. All hypochondriacal psychopaths show a defective "health conscience," and such people are often loosely and incorrectly called "hysterical" in consequence. It is probable that such patients are examples of a type of depressive temperament in whom the strain of Service is so great that they easily resort to subterfuge as a means of escape from an intolerable burden. In so far as this exploitation of symptoms is partly unconscious, we may speak of dissociation, but this is not necessarily fundamental to the personality. It represents merely that tendency to hysterical response of which it has been said all are capable, facilitated here by the sense of impunity. The term "hysteria" is best avoided, therefore, for this group. These remarks have been added to assist in a clearer apprehension of clinical hysteria.

With regard to frequency, out of a total of 376 neuropsychiatric admissions to Barrow Gurney in the six months January to June 1940, 63 were classified under the heading of hysteria (16 8 per cent ) It is of interest to compare this with civilian figures In the four years 1932 to 1935 188 cases diagnosed as hysteria were admitted to the Maudsley Hospital out of a total of 2 853 (6 5 per cent ) Whilst obviously both groups of figures cannot be compared without statistical corrections and for other reasons e g selection of material in both groups the difference is striking especially when we consider that the proportion of hysterics admitted to the Maudsley is likely to be relatively high

An analysis of the figures of this group shows the wide range of variation of hysterical phenomena The following table makes this clear —

| | |
|---|---|
| (1) Conversion symptoms | 11 |
| (2) Fugues | 2 |
| (3) Hysterical character | 12 |
| (4) Hysterical features in basis of post-concussional syndrome | |
| (5) Other organic basis (including cardiac and gastric symptoms) | 1 |
| (6) Hysterical psychoses | |
| (a) Pseudo-dementia | |
| (b) Stupor | 1 |
| (c) Anxiety | 4 |
| (d) Other hysterical reactions | 1 |
| (e) Hypochondriasis | 1 |
| (7) Fits | 1 |
| (8) Isolated hysterical symptoms | |
| (a) Headache | 2 |
| (b) Enuresis | 1 |
| (c) Neuralgia | 1 |
| | [illegible] |

It must be pointed out that this classification shows much inevitable overlapping between the groups Again this table does not show all the cases of fugue with subsequent amnesia for the episode since several of these occurred in the course of a depression often at the beginning and are thus classified elsewhere under the heading of the fundamental illness

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# THE DEMONSTRATION OF TUBERCLE BACILLI IN SPUTUM WITH SPECIAL REFERENCE TO THE FLOTATION TECHNIQUE

By Surgeon Commander R J G PROCTOR M A M D F R C P D P H R N

In this short article I shall dismiss cultural methods and animal inoculation in a few words I have found the Lowenstein Jensen medium for the cultivation of tubercle bacilli very satisfactory and all I wish to say about animal inoculation is that it is important to use a guinea pig weighing between 300-400 grm for this purpose If a heavier one is used it may have considerable resistance to the tubercle bacillus and there may not be enough tubercle bacilli present in the sputum inoculated in consequence of which the pig would not die and show signs of tuberculosis and false conclusions might be arrived at.

A twenty four hour specimen of sputum is strongly recommended but if single specimens are to be examined the morning sputum is by far the most likely to contain tubercle bacilli. Clean sputum containers should be provided for patients. Sterile containers are unnecessary. Phenol or tricresol can be used as preservatives in the containers. As far as possible particles of food &c should be excluded from the sputum and the collection of deep bronchial secretions should be aimed at. Secretions from the mouth or nasopharynx are useless for examination purposes. For direct examination smears are made from suspicious particles in the sputum. These include purulent streaks greyish or yellowish cheesy masses &c. Great care should be taken to distinguish these from particles of food. The smears should be stained by the Ziehl Neelsen method and it should be remembered that it is practically impossible either to over-stain or over-decolorize in this process.

When there are few tubercle bacilli in the sputum various concentration methods may be necessary to reveal their purpose. One well known method is the antiformin process which digests the sputum and dissolves other bacteria. Another is by using liquor sodæ chlorinatæ (Labarraque's solution) double strength adding 7½ per cent sodium hydrate. A very simple method of concentrating tubercle bacilli in sputum is to add to some sputum in a test tube an equal volume of 0·2 per cent NaOH shake heat for ten minutes at 100° C and centrifuge. Films are made from the deposit and stained by Ziehl Neelsen's method however in this case the treatment with carbol fuchsin should be applied for twenty minutes as the NaOH tends to cause faint staining.

Emulsion and flotation techniques date back to 1909 when Lange and Nitsche showed that liquid hydrocarbons could be used to separate tubercle bacilli from a watery suspension and they applied this principle to sputum examination with considerable success. Many aliphatic or aromatic hydrocarbons with a specific gravity less than water could be used but Ligroin was considered to be the most suitable of all because it has a sufficiently high specific gravity to delay separation and prolong the contact with the water phase and also it has a sufficiently low boiling point to facilitate rapid evaporation from the films. The sputum was dissolved with N 1 potassium hydroxide by pepsin digest or autolysis. It was found that alkali gave a better emulsion and in consequence it was given preference. The solution which was about 100 c mm was shaken with 2 c mm Ligroin and the mixture allowed to stand until separation took place. Films were then made from the Ligroin layer the portions at the boundary between the fluids being pecially selected. It was [illegible] obtained by this method.

This technique did not pass into general use for sputum, although it became and still is one of the best recognized methods for feces. In 1931 Pottinger reviewed the method in detail and modified it for use with sputum. He used weak alkali as a solvent and Ligroin, xylol or commercial petrol as the hydrocarbon phase. His technique was as follows: To an entire twenty four hour or three day specimen of sputum in the original container, an equal volume of 0.5 per cent sodium hydroxide was added, the mixture shaken and heated to 55° C for thirty to sixty minutes. It was then diluted to 200 c.c. with water, 1 to 2 c.c. of hydrocarbon added, and the whole shaken for ten minutes. After ten to twenty minutes standing to allow the hydrocarbon to separate, the latter was pipetted off, avoiding the water phase, and filmed on slides kept at 65° C, the emulsion being applied layer by layer as the film dried.

Pottinger, whose results were published only after fifteen years experience of the method, stresses four points: (a) The viscosity of the solution must be reduced by dilution until close to that of water, requiring 15 to 70-fold dilution according to the specimen. (b) Excess of undissolved residue which settles from the sputum solution on standing should be removed before adding the hydrocarbon, since it interferes with the separation of the droplets. (c) The bacilli in the film are very sensitive to the decolorizing effect of alcohol, which should not be applied for more than twenty seconds. (d) An important feature in the success of the method is the effect of the hydrocarbon in breaking up clumps of bacilli, which become scattered uniformly through the film, much increasing the chance of discovery.

Pottinger, using xylol as hydrocarbon, found sixty times as many tubercle bacilli by flotation technique as in direct smears, and that as few as 1,000 tubercle bacilli in a twenty four hours specimen can yield a positive result.

In 1936 Smith described a modified technique as follows: The sputum of three days is collected in an eight ounce wide mouthed bottle and shaken five minutes by machine with an equal amount of 0.5 per cent sodium hydroxide. After incubation in a water bath for thirty minutes at 55° C, any debris collected at the bottom is pipetted off. The specimen is diluted to about 200 c.c. with distilled water and shaken five minutes with 0.5 to 1.0 c.c. of xylol. On standing half an hour or more a creamlike layer forms at the top. This "cream" is skimmed off with a pipette equipped with a rubber bulb and the pipette placed in a rack at an angle of 45° for further layering. The clear subnatant liquid is returned to the bottle and the drop of cream spotted on a glass slide which is kept on a covered water bath at 60° C. The skimming process is repeated until a spot three to six layers drop and about 1 c.cm. in [illegible] drained, each drop being allowed to dry before the next is added. The smear is washed with ether, stained ten minutes with carbol fuchsin [illegible] water bath, decolorized one to two minutes with 3 per cent. hydrochloric acid in alcohol and counterstained with 1 per cent. aqueous picric acid.

It is considered that tubercle bacilli in concentrations as low as 0.000001 mgm. per c.c. [illegible] are detected by this method, or an average of [illegible] times as many acid-fast organisms as in direct smears. Its advantages are obvious and need no comment.

I started the flotation technique as described by Smith early in 1940 in the Laboratory of the Royal Naval Hospital, Haslar. After some work on the subject and a little experience we modified the technique to the following, as this method appears to give a still greater concentration of tubercle bacilli and it minimises still further the possibility of negative results in positive cases. (1) The sputum, to which an equal amount of filtered 0.5 per cent. NaOH is added, is placed in a 250 c.c. narrow-necked chemically clean measuring flask. If a larger amount of sputum is being examined, e.g. three consecutive twenty-four hour specimens, a larger flask of sufficient capacity to ensure a final watery solution should be used. (2) Shake for five minutes by hand or machine. (3) Incubate in a water bath at 55° C. for half an hour. Pipette off any debris that may collect at the bottom of the flask. (4) Dilute with aqua destillata sufficiently to make a watery solution. (5) Add 0.5 to 1.0 c.c. of xylol and shake for five minutes. Then add sufficient aqua destillata to take the level of the fluid into the neck of the container. (6) Allow to stand until the xylol has separated in the form of a cream-like layer. (7) Pipette off all xylol cream and place in a tapered centrifuge tube. Allow to stand until any fluid pipetted off with cream has separated out. (8) Pipette off subnatant fluid in centrifuge tube. (9) Break down xylol with alcohol or acetone and mix until clear, using original pipette, thus breaking down any adherent xylol in pipette. (10) Centrifuge at 3,000 revolutions per minute for fifteen minutes. (11) Pipette off supernatant fluid and well mix sediment with trace of alcohol left in tube from stage (9) and then pipette sediment drop by drop on to slide which is placed on heated surface, e.g. 60° C. bath or top of microscope lamp. Allow each drop or 'spot' to dry before adding next and concentrate in as small an area as possible. (12) Stain in the usual manner, allowing a little longer staining with carbol fuchsin to compensate for loss of staining power due to the action of NaOH, or stain by Fontes' method.

If subjecting a pleural fluid to the above technique it has been found that the addition of a few drops of alcohol at stage (5) (i.e. when making up the level of the liquid to reach the neck of the container) proves quite satis-

[illegible] in [illegible] fully added no apprec[illegible]

Further reference in [illegible] will be designated F T ([illegible]) will be called M F T (M[illegible]) [illegible] venience

Some details of the [illegible] F T and M F T will now be given in the foll[illegible] specimens of sputum, and where negative [illegible] negative by all techniques. The specimens found positive [illegible] noted [illegible]

| Date | Negative | Positive | Note |
|---|---|---|---|
| 27 3 40 | 1 | | |
| 31 3 40 | 1 | 1 | Case A [illegible] M F T [illegible] |
| 4 4 40 | 1 | | |
| [illegible] 4 40 | | 1 | Case [illegible] M F T [illegible] |
| 10 4 40 | 5 | 1 | Case [illegible] F T [illegible] M F T [illegible] |
| 29 4 40 | | 1 | Case [illegible] |
| 1 5 40 | 4 | | |
| 2 5 40 | | 1 | Case C [illegible] M F T [illegible] |
| 3 5 40 | 3 | 1 | [illegible] |
| [illegible] 5 40 | | 1 | Case [illegible] M F T [illegible] |
| 1 5 40 | | 1 | Case [illegible] M F T [illegible] |
| 10 5 40 | 1 | | |
| 11 5 40 | 1 | | |
| 14 5 40 | | 2 | Cases B and D [illegible] F T and M F T [illegible] direct films |
| [illegible] 5 40 | 4 | | |
| 21 5 40 | | 1 | Case D Positive in F T and M F T [illegible] methods |
| [illegible] 40 | 2 | 1 | Case E Sputum [illegible] T B were seen [illegible] The [illegible] remarks on the [illegible] M F T were [illegible] been positive direct [illegible] |
| [illegible] 40 | | 2 | Case F Confirmatory [illegible] T B in M F T [illegible] |
| 24 5 40 | | 1 | Case G [illegible] to be a case of [illegible] direct films T B present in M F T [illegible] |

| Date | Number | Positive | Notes |
|---|---|---|---|
| [illegible] | 13 | | |
| [illegible] | | 1 | Case H Histological evidence [illegible] and M F T Not in direct films |
| [illegible] | 11 | | |
| [illegible] | | 3 | Inadequate specimens from positive cases [illegible] Numerous T B by M F T and F T Not seen in direct films |
| [illegible] | | 1 | Case [illegible] Positive in F T and M F T None in direct films |
| [illegible] | [illegible] | 1 | Positive in M F T only which showed a few scattered tubercle bacilli |
| [illegible] | [illegible] | 1 | The positive cases by F T and M F T were all negative in direct films |

Between March 2[illegible] 1940 and August 6, 1940 one hundred sputa were sent to the Laboratory for examination for the presence of T B of which twenty nine which showed no T B in direct films were proved positive by F T and/or M F T Of these twenty nine positive specimens 62 07 per cent were positive by F T and M F T and 37 93 per cent were positive by M F T only None were positive by F T only It is fully appreciated that examination by direct film involves only a portion of suspicious looking material in a specimen of sputum whereas in the flotation technique the greater part of the specimen is utilized

The above examinations have been recorded as accurately as possible and have been performed in the majority of cases from very inadequate specimens which at times appeared to be one expectoration only It must also be emphasized that the direct films were proved negative by various technicians on different occasions

The following are approximate enumerations of tubercle bacilli in ten fields from D F (Direct film) F T and M F T of various cases —

Case I

| Number of fields | Direct film | Flotation technique | Modified flotation technique |
|---|---|---|---|
| 1 | — | 4 | 70 |
| 2 | — | 4 | 120 |
| 3 | — | 6 | 60 |
| 4 | — | 8 | 200 |
| 5 | — | 10 | 90 |
| 6 | 1 | 12 | 50 |
| | — | 22 | 35 |
| 8 | — | 13 | 130 |
| 9 | 2 | 13 | 80 |
| 10 | — | 14 | 60 |
| | 3 | 101 | 900 |

The above were enumerated with a 1 mm aperture Ehrlich's eyepiece

## [illegible]

| Number of fields | [illegible] | [illegible] | [illegible] |
|---|---|---|---|
| 1 | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] |
| 10 | 1 | [illegible] | [illegible] |
| [illegible] | 4 | [illegible] | [illegible] |
| 11 | [illegible] | [illegible] | 1 |
| | [illegible] | [illegible] | [illegible] |

The above [illegible] with [illegible] In F.F. and M.P.T. [illegible] fields [illegible] estimated [illegible] of M.P.T. [illegible]

## Case 3

| Number of fields | D.F. | [illegible] | [illegible] |
|---|---|---|---|
| 1 | — | — | [illegible] |
| 2 | — | — | [illegible] |
| 3 | — | 1 | [illegible] |
| 4 | | [illegible] | [illegible] |
| | — | | [illegible] |
| [illegible] | — | [illegible] | [illegible] |
| | — | 1 | [illegible] |
| 8 | | — | 1 |
| 9 | | — | [illegible] |
| 10 | | [illegible] | [illegible] |
| | Nil | [illegible] | [illegible] |

The above were enumerated with [illegible]

## Case 4

| Number of fields | D.F. | [illegible] | [illegible] |
|---|---|---|---|
| 1 | — | [illegible] | [illegible] |
| 2 | | [illegible] | [illegible] |
| 3 | 1 | 1 | [illegible] |
| 4 | — | | |
| | [illegible] | 1 | [illegible] |
| 6 | | | |
| 7 | 1 | [illegible] | [illegible] |
| 8 | | 1 | [illegible] |
| 9 | [illegible] | 1 | [illegible] |
| 10 | 2 | 1 | [illegible] |
| | 6 | [illegible] | [illegible] |

The above were [illegible]

## Case 5

Systematic examination of [illegible] slide revealed [illegible] M.P.T. [illegible] lide showed twenty five tubercle bacilli [illegible] by D.F.

### Case [illegible]

| Number of fields | [illegible] | F.T. | M.F.T. |
|---|---|---|---|
| 1 | — | 7 | 92 |
| 2 | | 1 | 160 |
| 3 | | 3 | 213 |
| 4 | | 8 | 176 |
| 5 | | 9 | 2[illegible] |
| 6 | | 1 | 11[illegible] |
| 7 | | | 6 |
| 8 | | 11 | 1[illegible]4 |
| 9 | | [illegible] | [illegible] |
| 10 | | 11 | 150 |
| | Nil | 1[illegible] | 1,[illegible] |

The above were [illegible] per [illegible] microscopic fields.

### Case [illegible]

The specimen received consisted of a few small portions of [illegible] blood [illegible] the following results:

| [illegible] fields | B.I. | F.T. | M.F.T. |
|---|---|---|---|
| 1 | | | |
| 2 | | | 2 |
| 3 | | | 6 |
| 4 | | | 6 |
| 5 | | | 2 |
| 6 | | | |
| 7 | | | 1 |
| 8 | | | — |
| 9 | | — | 1 |
| | Nil | Nil | 2[illegible] |

The above [illegible] per [illegible] fields.

### Case [illegible]

[illegible] examined and revealed one [illegible] tubercle bacilli [illegible] making a total [illegible] tubercle bacilli [illegible] fields [illegible] F.T. were counted [illegible] results were as follows:

| Number of fields | [illegible] counted |
|---|---|
| 1 | — |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | 1 |
| | [illegible] bacilli |

The above [illegible] fields.

A platinum loop full of known positive sputum was smeared on a slide stained by Ziehl-Neelsen [illegible] examination approximately 1,5[illegible] to 2,000 tubercle bacilli were demonstrated. A [illegible] loop full [illegible] M F T [illegible] [illegible]

[illegible] [illegible]

[illegible] *D* [illegible] Re[illegible]

[illegible] in some [illegible]

In the M F T [illegible] the flask. This [illegible] fluid which [illegible] no loss of [illegible] tube on the [illegible] Repeated skim[illegible] sediment does [illegible] than that of an [illegible] out carefully is [illegible] Tubercle bacilli ha[illegible] T has failed to [illegible]

Good results have [illegible] by M F T F T and other [illegible] prove a negative r[illegible] M F T [illegible] when M F T was [illegible] negative result [illegible] second [illegible] of [illegible] M F T [illegible] results on several [illegible] bacilli are floated out in the [illegible]

The M F T has prove[illegible] little alcohol to pleural fluid [illegible] the M F T [illegible] satisfactory results. One [illegible] pig inoculation also gave [illegible] proved to be negative by all [illegible]

---

1

[illegible] containing N.T.F. [illegible] upper [illegible] organized [illegible] point [illegible] and [illegible] the [illegible] and [illegible] control [illegible] M.F.T. [illegible]

Summarizing, [illegible] an account of the [illegible] method of demonstrating tubercle bacilli in sputum, excluding [illegible] and animal inoculation [illegible]. Our results show the [illegible] of flotation over other procedures [illegible] the higher concentration [illegible] better distribution of tubercle bacilli [illegible] smears and [illegible] likelihood of detecting the organisms. [illegible] compared with [illegible] methods a result is obtained the same [illegible]. In the Modified Flotation Technique (M.F.T.) the important advantages as indicated above are more pronounced.

My sincerest thanks are due to my technician, Leading Sick Berth Attendant I. Bone, R.N., whose energy and zeal contributed greatly to the results obtained in this paper.

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## GAS GANGRENE AT SEA

By Surgeon Lieutenant-Commander ARNOLD HINDHAUGH, F.R.C.S.(Eng.), R.N.V.R.

The purpose of this article is to put on record a series of seven cases of gas gangrene, six of which occurred following limb wounds sustained at sea. I can find no previous record of gas gangrene occurring at sea and believe that these are the first of such cases to be recorded.

The first case was observed in April 1940 and it came as a distinct surprise. [illegible] one associates gas gangrene infection with wounds sustained in cultivated fields or in the street accidents of civil surgery, and it was difficult to understand why it should occur in a ship. The organisms of gas gangrene [illegible] well known [illegible] possible that the [illegible] bones and muscles [illegible] soiled [illegible] possible to get a [illegible] there has been [illegible] results had [illegible] remark in this [illegible]

The [illegible] occur is pierced by [illegible] gangrene organisms [illegible] wound in all these [illegible] and [illegible] arm wounds have been [illegible] develop [illegible] to my knowledge that [illegible] wound sustained at [illegible] from Dunkirk [illegible] has also been cast on [illegible] plaster [illegible] casts as a possible source of [illegible] infection.

*Case 1.*—Leading [illegible] He was admitted following [illegible] explosion in his ship and [illegible] after being [illegible] right thigh which [illegible] in the right buttock [illegible] tion and a punctured [illegible] When [illegible] was exposed there was a [illegible] reddish brown fluid [illegible] from it. There was [illegible] the left [illegible] leg and paralysis of the [illegible] bomb fragment in the [illegible] ence of gas but the existence [illegible] this observation [illegible] wound.

The outlook was poor but [illegible] to do all that was possible [illegible] opened and flaps of skin [illegible] The gluteus maximus was [illegible] the hamstrings [illegible] tion. The affected muscles [illegible] peroxide and left open. [illegible] recovered from the [illegible] Muscle excision [illegible] tion because [illegible] amputation.

*Case 2.*—Stoker [illegible] wounded in his thigh [illegible] and calf. There was [illegible] of the skin to [illegible] showed the presence of gas [illegible]

Under general [illegible]

[illegible] muscles were black [illegible] and [illegible] joint [illegible] performed [illegible] large flaps of skin and fat to cover [illegible] after removing [illegible] portions of the gluteal [illegible] The [illegible] is given a port [illegible] treatment [illegible] gas gangrene [illegible] brought [illegible] the time [illegible] large [illegible]

[illegible] after [illegible]

[illegible]

[illegible]

[illegible]

[illegible] was deemed [illegible] tate I obviously. The [illegible] affected. Th[illegible] open. Healin[illegible] he walked perfectly [illegible] of 19 grm. [illegible]

I believe that [illegible] both quadriceps [illegible] Instance from the [illegible] secured from [illegible] proof of [illegible] after partial [illegible] culture [illegible] failed to show [illegible]

The following [illegible]

*Present Operation.* The [illegible] closure of the [illegible] excision of [illegible] the most important [illegible]

*During the* [illegible] 2, 3, 4 [illegible] was seen [illegible] in X-ray [illegible]

[illegible] failure of [illegible] on the muscle.

*[illegible] Treatment.* The [illegible] the relative [illegible] results obtained [illegible] sulphanilamide [illegible] the earliest [illegible] conservative [illegible] Case 2 [illegible]

[illegible] *al Remarks* [illegible] involving muscle [illegible] deep fascia [illegible] with deep [illegible] prophylactic [illegible]

[illegible] Amputation [illegible] gas gangrene [illegible] think that the [illegible] following injury to the leg [illegible] preserve a leg [illegible] gangrene followed [illegible]

With [illegible] drug [illegible] been [illegible] and [illegible] Sulphapyridine [illegible]

Ani[illegible] of much [illegible] should be [illegible] would [illegible] It possible [illegible] be identified [illegible] Experience [illegible] together [illegible] together with operation may [illegible] cases until a large [illegible] has been collected

Experiments [illegible] which were [illegible] local application [illegible] sulphanilamide [illegible] general [illegible] well as the [illegible]

Article [illegible] Surgeon [illegible] trial [illegible]

I [illegible]

Many [illegible] cent [illegible] paper [illegible] Wallace [illegible] M N [illegible] and Neligan

In conclusion [illegible] Surgeon Rear Admiral M N [illegible] Surgeon Captain [illegible] Medical [illegible] *Amarapoora* [illegible]

abnormally sh[illegible] in 15 per cent. of the [illegible] usually [illegible] of the cystic and co[illegible] if not noticed at the [illegible] explain [illegible] fistula. The arteries [illegible] irregular [illegible] rules the relation [illegible] and if hæmorrhage [illegible] arise. Attempts to [illegible] may result in still further [illegible] of the biliary ducts [illegible] ligatured.

*Diagnosis.*—Dis[illegible] gall-bladder [illegible] It is estimated that some [illegible] gall-stones usually silently [illegible] history of the essential [illegible] examination. [illegible] investigation, but there is real danger that [illegible] with adjuncts. [illegible] than any short [illegible] and with increasing [illegible] in the majority [illegible] corner of the abdomen [illegible] it is only too easy to allow the [illegible] an undue impression [illegible] path. The cardinal [illegible] human frame can [illegible] accompanied by [illegible] to the right scapular area [illegible] the up[illegible] and sometimes [illegible] gall-bladder is [illegible] common duct is obstructed [illegible] ing jaundice without [illegible] infection of the biliary [illegible] definitely feels [illegible] perhaps the phrase [illegible] Usually he has tried [illegible] When [illegible] the common duct with [illegible] and is quite characteristic [illegible]

Those cases in which [illegible] measures the thing that [illegible] who have suffered [illegible] and may be willing [illegible] ask for surgical treatment [illegible]

[illegible] this [illegible] to risk [illegible] whether [illegible] and [illegible] the outlook is promising. The other [illegible] one [illegible] more cautious approach. True, a [illegible] will be relieved by surgery, but it must be remembered [illegible] will be relieved by this means than the [illegible] the explanation being that in these [illegible] able damage has been done by infection far up the [illegible] the common surgical procedures performed at one end of [illegible] a complete cure. To put the matter shortly, stone [illegible] most gratifying upshot, but cholecystitis plus surgery [illegible] disappointment. When symptoms persist despite drugs [illegible] with this reservation, and should be recommended [illegible] the longer the infection lasts the greater the damage to the [illegible] greater the risk to the patient.

[illegible] has improved rapidly, so much so that there [illegible] this overmuch. It cannot be overstressed that [illegible] radiology later, and even then with the reserve [illegible] may lead one astray. A direct stone shadow depends [illegible] content, and only 10 to 15 per cent. of the [illegible] first picture. This of course tells nothing [illegible] itself. A barium meal may show some [illegible] flattening of the cap when adhesions are [illegible] made in the X-ray appearances a diagnosis [illegible] case. Cholecystography means the [illegible] excreted into the gall-bladder, and then [illegible] on the screen. It is in fact a physio[illegible] of the opaque meal [illegible] the test. For instance the ingestion of food [illegible] the result. Provided that the [illegible] appear, one may assume that there [illegible] shadow may be interpreted [illegible] the cystic duct is blocked, or that [illegible] either [illegible] gall-bladder [illegible] lymphatic [illegible] the most common cause of this non-[illegible] Opaque stones may have been seen in the [illegible] statistics. Cholecystography has been [illegible] appears to lessen the shadow [illegible] gall-bladder.

[illegible] *the Patient.*—It has lately been recognized that an opera[illegible] in a chain [illegible] and that another link, namely, the [illegible] where [illegible] Its [illegible] is rare and [illegible] stage and [illegible] poor operative [illegible] patient is likely [illegible] vitality. A sh[illegible] than well spent [illegible] sepsis should b[illegible] glucose to rep[illegible] the most impor[illegible] is now known [illegible] the apparently [illegible] and delayed [illegible] calcium chloride [illegible] The patient [illegible] resting quietly in bed.

*Operation.* [illegible] carefully supplemented [illegible]

[illegible]

The next [illegible]

[illegible] explored. During [illegible] the appendix [illegible] the [illegible] procedure [illegible] than cholecyst[illegible] The gall-bladder [illegible] in the gall-bladder [illegible] exposed by [illegible] What all [illegible]

[illegible]

Cholecystenterostomy is the anastomosing of the fundus of the gall bladder to the stomach or preferably to the duodenum for permanent drainage of the gall bladder in cases of inoperable obstruction. In [illegible] cases it was only required once and provided relief from [illegible] and discomfort for some months until the slow increase [illegible] led to the inevitable end.

Choledochotomy is incision and exploration of the common [illegible]. In three cases in this series has this procedure been found necessary. After clearing the common duct it must be considered how the duct can best be drained. If the gall bladder be still present a tube in the [illegible] large drain to the right kidney pouch gives a good result [illegible] cystectomy has been performed the dilated cystic duct [illegible] point for drainage. Even if such indirect drainage is provided [illegible] employ direct drainage; this is certainly so if sepsis [illegible] present. This can be effected by a branch tubing, the [illegible] in diameter being sutured within the common duct and [illegible] drain to the right kidney pouch. The latter can be removed [illegible] days time, whereas the duct drain will detach itself in about [illegible] then be withdrawn. Care should be taken with the [illegible] lest extravasation of bile take place into the [illegible] peritoneum leading to diffuse or localized peritonitis [illegible] further operation for drainage.

Carcinoma of the biliary tract is by no means rare and is usually associated with stones. The diagnosis is mostly doubtful [illegible] seldom made in time for a radical cure. Spreading [illegible] liver is somewhat rapid.

*Injuries.*—Rupture of [illegible] of the ducts [illegible] in crush accidents and this is becoming more frequent with the [illegible] accidents. The repair of such injuries is a matter of [illegible] and naturally of great urgency. [illegible] series. In one case which was technically difficult [illegible] injured the right hepatic duct which was adherent [illegible] mass of dense adhesions; the patient became [illegible] period of inanition that lasted some four months. In [illegible] hepatic duct was injured under similar circumstances [illegible] developed after cholecystectomy; an exploration [illegible] abandoned owing to the patient's condition. The [illegible] the some three years later of acute [illegible] of the [illegible].

### NOTES ON SOME OF THE CASES IN THIS SERIES

*Case* 1.—F. E., female, aged 45. Civil Service. In 1922 a cholecystostomy was done for recurrent attacks of acute cholecystitis [illegible] and the wound closed without any further ado. The [illegible] persisted over a period of years intermittently, the pain [illegible]

[illegible] ever forthcoming [illegible] drugs [illegible] effect [illegible] meaning that the [illegible] another [illegible] can honestly admitted [illegible] hazarded [illegible] with equivocal symptoms [illegible] investigation [illegible] the findings of the [illegible] only with [illegible]

[illegible] H. [illegible] signs and symptoms [illegible] infection [illegible] with stones [illegible] light on [illegible] After [illegible] pronounced [illegible] and remained [illegible] for some [illegible] well and [illegible] Operation [illegible] that the question [illegible] disclosed [illegible] debris and [illegible] essential [illegible] and simple [illegible] result.

[illegible] biliary colic [illegible] Operation [illegible] gall bladder [illegible] much and [illegible] in the [illegible] tomy per [illegible] symptoms.

[illegible] Housewife. [illegible] known of [illegible] tumour for some time [illegible] In 1926 [illegible] gall bladder [illegible] amount [illegible] into the right [illegible] the gall bladder [illegible] 1932, when [illegible] was then [illegible] from the gall bladder [illegible] has [illegible]

[illegible] The gall bladder [illegible] full of debris [illegible] [illegible] drained. [illegible] through the [illegible] establishing [illegible]

## Results of Surgical Treatment

Cholecystectomy gives relief in about 80 per cent. of those cases in which calculi are present with obstruction, and is the operation of choice that should be carried out where the conditions are suitable. If cholecystitis alone is the lesion, the results are far less good, and some doubt arises as to whether [illegible] treatment is justified. Indeed, conscience has to be salved by the knowledge that calculi are almost certain to follow cholecystitis in [illegible] Cholecystostomy is to be avoided if possible, and reserved for such [illegible] the more difficult operation is impossible to carry out. It will [illegible] in about 40 per cent. of the cases operated upon, but it carries with [illegible] mortality rate, and has other disadvantages. A good example is [illegible] scant [illegible] later [illegible] cholecystectomy [illegible]

[illegible]

[illegible]

| [illegible] | [illegible] |
|---|---|
| [illegible] | 1 |
| 40—51 | 11 |
| 50—60 | [illegible] |
| 60—70 | 1[illegible] |
| 70—80 | |

Calculi were present in fifty-seven cases [illegible] gall bladder the largest number actually counted in [illegible] Calculi were found in the common bile duct in six cases [illegible] in the right hepatic duct In three cases it was necessary to drain [illegible] common duct

Empyema of the gall bladder was present in ten cases

| | M. | F. | [illegible] | Deaths |
|---|---|---|---|---|
| Cholecystectomy | 5 | 36 | 11 | [illegible] |
| Cholecystostomy | 8 | [illegible] | 11 | [illegible] |
| Cholecystenterostomy | | 1 | | |
| Carcinoma of C.B.D. | | 1 | 1 | 1 |
| Cyst of Liver | | 1 | 1 | — |

*Mortality*.—Cholecystectomy was performed forty-one times with three deaths One patient died of bronchopneumonia and one of peritonitis mostly spreading down the right kidney pouch though there was no evidence of bile leakage to cause this

Cholecystostomy was done in thirty cases with two deaths both from subphrenic abscess

Complications apart from technical difficulties, were one case of peritonitis and two cases of subphrenic abscess after operation all of which [illegible] fatally In one patient pancreatitis with well marked fat necrosis was found at operation this man recovered although desperately ill with very [illegible] drainage of the upper abdomen and right kidney pouch One [illegible] had a pyloric ulcer with pyloric obstruction as well as a large number of [illegible] calculi here a gastro-jejunostomy was performed in addition to cholecystectomy with very satisfactory result

Cholecystitis treated by cholecystostomy gave incomplete [illegible] cases, while cholecystitis plus calculi treated by cholecystectomy failed to relieve in one case.

In three cases cholecystostomy for empyema of the gall bladder had to be followed up later when the state of the patient was less acute by cholecystectomy.

A study of the notes gives some indication of the tremendous amount of ill health, frequently associated with intolerable pain, that is represented by these dry figures. At the same time it is a matter for thankfulness that we are enabled to give so much relief to those who entrust themselves to our care. In more than three-quarters of the series calculi were present, and it is in these very cases that pain of an intolerable type is the outstanding feature. Surgery gave complete satisfaction to the victim of this fate, assuredly the acid test of our efforts. In the remaining cases in which cholecystitis was the main trouble, the results were less gratifying; the symptoms tend to recur, though usually in a less severe form, more perhaps from our ignorance of how to deal with the disease than from technical faults. The patient naturally expects relief, and complete relief, after the ordeal of an abdominal section. The satisfaction of this desire should urge us on to find some more certain method. The biochemist, whose recent [illegible] are so striking, may in time come to our rescue.

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## MEMORANDUM ON THE EARLY TREATMENT OF CLOSED HEAD INJURIES

### Definition

By "closed head" injuries we understand the absence of a compound fracture of the vault of the skull, a condition which automatically results in a certain amount of cerebral decompression. If the fracture is a compound one the problem of infection is at once introduced. Fractures of the base of the skull are also considered in this connection as "closed" injuries (and are dealt with in a separate section of this memorandum), though in practice they are usually compound.

## PREAMBLE

If a patient has been rendered unconscious for any length [illegible] head injury it may be assumed that some brain [illegible] Brain, like other tissues, in reacting to injury swells. If [illegible] allowed to occur the power of recovery of [illegible] this applies equally to brain tissue. If however [illegible] swelling [illegible] prevented altogether a varying degree of permanent [illegible] This important principle of pathology is exemplified by [illegible] organ capable of expansion—like the kidney [illegible] injury with an organ incapable of expansion—[illegible] capsule is thin and readily distensible, the testicle [illegible] is tough, fibrous and comparatively unelastic. [illegible] recovers and functions normally; the [illegible] quently atrophies. This is the explanation of the [illegible] the scrotum develops a [illegible]

The brain is comparable with the [illegible] skull and the incompressibility of the fluid [illegible] spinal fluid, but it may be given a chance to swell by [illegible] of this incompressible fluid. As the swelling [illegible] this is best done by dehydration (*[illegible]*).

## OBJECT OF TREATMENT

In view of the foregoing considerations [illegible] head injuries must be to allow the brain to [illegible] its subsequent recovery may be maximal. The [illegible] be therefore to avoid any restraint of the [illegible] brain to swell. This might theoretically be [illegible]

(1) By widely opening the skull.

(2) By repeated lumbar punctures [illegible]

(3) By dehydration which [illegible]

The third of these procedures is the best [illegible] devoid of the risk of (1), and it [illegible] process than the rather sudden reductions of [illegible]

Dehydration can be produced either by [illegible] tion of hypertonic solutions, e.g. saline, sucrose [illegible] rectal administration of magnesium sulphate [illegible] cedure because the effect on the swollen brain [illegible] continued as equally effective as other methods [illegible] a gentle and continued procedure [illegible] the cause of the brain swelling is [illegible] progressive character. It is therefore best [illegible] dehydration.

[illegible]

(1) The [illegible] should [illegible] compressed [illegible] the root of the neck [illegible] compressed by tight neck [illegible] of pyjamas or other garments, and the neck [illegible] unduly flexed [illegible] thereby kinked.

(2) Magnesium sulphate [illegible] concentration should be gently and slowly run [illegible] every six hours—six [illegible] solution being run [illegible] (No. 8 or 10 English) soft rubber catheter [illegible] (Nurses should [illegible] explicit instruction in this matter.)

(3) The patient's fluid [illegible] should be [illegible] (A [illegible] of the [illegible] the patient which must not be completely [illegible].)

DURATION OF DEHYDRATION

The dehydration regime should be continued at once and continued for [illegible] fortnight after the end of the period of unconsciousness or even longer according to the severity of the damage to the brain.

Time in bed. Throughout this time the patient should remain in bed.

After discontinuing the rectal instillation, sodium sulphate (Glauber's salt) should be given each morning for a few weeks more and the patient instructed to limit his fluid intake.

FRACTURES OF BASE OF SKULL

The cases under consideration are those of closed head injuries, i.e. unassociated with a compound fracture of the vault. (These latter cases call for urgent operation as do compound fractures elsewhere in the body.) There may, however, be an associated fracture of the base and this may be clinically evident by the escape of cerebrospinal fluid from the nose or ears. Such cases are also compound fractures, but for anatomical reasons they are not suitable for the early operative treatment which is indicated in the case of fractures of the vault and which is designed to protect the patient from infection. Patients with a fractured base should be given sulphapyridine tablets (1 grm.) every four hours for six days, and the orifices from which cerebrospinal fluid is escaping must be kept clean and dry (no syringing). Pieces of cotton wool soaked in 70 per cent. alcohol and well wrung out should be used to swab out gently these cavities twice daily, or even more often according to how profuse is the discharge of fluid. Hexamine grs. x should also be given thrice daily. (This substance traverses the choroid plexuses and is present in the cerebrospinal fluid. Although it is not itself antiseptic, in the presence of acid it is decomposed into formic aldehyde, an antiseptic, and if acid-forming organisms have entered the fluid hexamine is therefore probably inimical to them.)

[illegible] this dehydration at the same period during [illegible] teaching hospital that complications from cerebral [illegible] almost unknown. In this connection the [illegible] (cerebral irritation) is striking. [illegible] of a monoplegia, hemiplegia or other focal lesion, not initially [illegible] becomes apparent during the course of the dehydration treatment it may be concluded that this is due to haemorrhage and not to oedema, and [illegible] is therefore indicated. [illegible] in the case of a consulting physician with contusion and laceration of the brain associated with a fractured [illegible] dehydration was continued for seven weeks. He was unconscious [illegible] weeks following the head injury. He made a complete recovery and returned to consulting practice. As far as can be ascertained his brain [illegible] completely recovered despite the severity of the injury (three weeks [illegible] blood in cerebrospinal fluid).

It is highly important that this dehydration treatment should be [illegible] at once and maintained. The prognosis of cerebral contusion depends [illegible] upon it than any other factor. It is essential that it be instituted in order to avoid the sequelae otherwise so commonly seen after closed head injuries and due to unresolved cerebral contusion.

### After Treatment

This memorandum is concerned with the all-important primary treatment of these injuries, but the institution of quiet surroundings, the avoidance of alcohol and of mental and physical over-exertion, which constitute an important part of after-treatment, must not be overlooked. Many complications of head injuries are avoidable if correct treatment is instituted early and conscientiously pursued.

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## SOME SOUTH SEA ISLANDS

By Surgeon Lieutenant R. VAUGHAN JONES, M.B., R.N.

When Robert Louis Stevenson visited the Gilbert and Ellice Islands he described them as possessing "days of blinding sunshine and nights of heavenly gladness." Add to this recommendation the fact that these islands are inhabited by a well built, healthy, sabble brown people who are extremely polite and kind, and who possess the demeanour of happy laughing children. It will then be realized that life there is very pleasant. Old native customs predominate, and land is possessed by right of inheritance and is counted as wealth. The natives hold their own courts and have evolved their own laws. This system works well. The penalty for killing is death, and if this penalty should be awarded it must be carried out by the British Officer resident on the island, otherwise the hangman would forfeit his life. The Gilbertese natives are industrious, and their life centres round the coconut palm. This remarkable plant provides them with all their food, with the exception of fish; with covering for their heads (the inner [illegible] of the nut); with string for their canoes, called sennit, made of [illegible] fibre; and with vitamins which are present in the young shoots of the nut. Their thirst is quenched by the coconut milk, which at a certain stage is fizzy like gingerbeer, and is delightful to drink. Food for storage is made by boiling down the pulp of the nut to a sort of molasses which pressed together becomes "Kamaimai"; finally the native obtains his daily cup of tea from the sap of the tree, which is collected night and morning in a coconut shell and is called "toddy." "Toddy" is a pleasant rather syrupy drink, and if it is allowed to ferment in the sun for twenty-four hours it becomes strongly alcoholic, and the native is thrilled by the delights of intoxication. British law in the islands says that the brewing of this "sour toddy" must be severely punished, because the intoxicated native tends to attack and wound his friends. Each family has its own toddy tree, kept especially for this purpose, and when the toddy collector is up the tree he sings a little song. Some say this is to warn off the evil spirits; others more correctly say that it is to warn passers-by that he is up the tree, and thus stop their being injured by a falling nut. The native also uses the coconut palm for building his dwellings and canoes, and the products from it for trading purposes in order to obtain the European articles he desires from the small trading firms in the islands. From these firms he buys the things that delight him, such as brightly coloured hair combs, lurid, highly scented toilet powder, and brilliantine.

There are many quaint native customs in the islands, often connected with birth, marriage, or death. The old custom of betrothal is maintained, and marriages are arranged by the parents with a keen eye towards the amount of land the marriage may bring the family. Before marriage the bride goes into seclusion for three months, and, being deprived of the sun's rays, becomes a paler colour than usual, which lightness of skin is deemed a great attraction. An extremely high price is set upon virginity, and if the bride turns out not to be a virgin at the time of her marriage, it is immediately annulled. The ceremony takes place in the mass meeting house, and an especially woven, new, clean mat is set upon the floor. The women marry very young, usually about the age of sixteen, and the men a year or two older. The race matures early, and a woman is old and fat at thirty, and decrepit at forty. These natives strictly limit the number of their children to three; they have no means of birth control, but are expert abortionists and never fail. The actual birth is superintended by a native midwife whose methods are disgustingly unhygienic, but somehow the children are born in the normal manner and survive. Twins are exceptionally rare, and not welcomed, as the natives regard their birth as a superstitious ment. [illegible] the dead are buried in their ancestral lands, and [illegible] [illegible] the [illegible] will often carry the skull of an ancestor in his [illegible] bring him luck. Certain parts of the body, particularly the head, and are never mentioned in conversation [illegible] tabu. Venereal disease [illegible] case in the islands except when it has been introduced by some [illegible] has been working elsewhere on a plantation. There it is prevalent [illegible] prostitution does not occur in the sense we know it. The unmarried [illegible] are referred to by a [illegible] term, "Nikiranroro," which translated [illegible] the generous [illegible].

Stevenson rhapsodised lyrically in his praise of the Island of Butaritari [illegible] the northern Gilbert Islands, and deservedly so. It is an ideal Coral Island. The entrance to the lagoon through the reef is so wide that the lagoon seems to be part of the sea, and the island stretches for miles, a strip of land with masses of waving palms, their white trunks topped by [illegible] green verdure. As the ship enters the lagoon many native canoes [illegible] and sail out to greet each one with a complement of singing and happy Gilbertese. Although in some of the islands the water is deep enough for ships to anchor alongside the stone piers, at others the only means of getting ashore is by native canoe. These are wonderfully constructed and each island has its own method of building them. In the Gilbert Islands they make the canoes by preparing planks of a native wood about [illegible] feet long, four inches wide, and half an inch thick. These are bound edge to edge with sennit or coconut fibre, then caulked with native gum [illegible] which gradually a graceful [illegible] canoe takes shape. These [illegible] are sailed with a single triangular sail and a mast which is moved from one end of the canoe to the other when putting about. To counteract the [illegible] wind pressure on the sail the canoe has a "Rantarama" or outrigger, which at speed is lifted right out of the water, the canoe running out on it [illegible] back again. These fast sailing canoes are capable of speeds of over [illegible] miles an hour. In the Ellice Islands, [illegible] contrast, they do not build their canoes out of planks but hollow out the trunk of a tree with fire, and instead of sails they use paddles to propel the finished canoe. The Gilbertese are very good navigators and can traverse amazing distances in these canoes. Often they have travelled hundreds of miles. According to some theories there was a primaeval urge in them to travel ever eastwards and this is how the Polynesian race spread across the Pacific even as far as South America. They have a method of using [illegible] the stars, and from birth the small child is taught to regard the [illegible] the heavens as a map of the ocean.

Landing at an island like Butaritari one is welcomed by a crowd of happy natives. Among them [illegible] women belonging to one of the numerous Women's Leagues on the island, the "Britannia League" or the "Rainbow League." Most of them present their wreaths of sweetly smelling tropical flowers, prominent among which is the lovely Frangipani w[illegible] like white petals and yellow centre. There [illegible] dressed [illegible] policemen in their khaki uniform jackets and [illegible]. The ladies both wear a wide [illegible] grass skirt, however if the island is over missionized they wear a most ungainly and unhygienic dress with long sleeves known as a "Mother Hubbard," which they never wash and which prevents the health giving sun shining on their lovely bodies. At some of the islands in the Ellice group this "Mother Hubbard" dress is not enforced and the ladies look far more attractive with beads round their necks and brightly coloured skirts of plaited grass. These swing with a most graceful movement as they walk with no movement of their shoulders but the maximum movement of their hips, giving their gait a most attractive gliding motion. The crowd accompanies the visitors to the village meeting house, an enormous native building. At Butaritari the "Maneapa" must be fully seventy feet in height and two hundred feet long. The framework is constructed of coconut palms and the roof is native thatching. It extends down to about five feet from the ground on all sides without walls, and this low eave means that all entering have to dip their heads in respectful salute. Here the people of the island congregate together and an official reception is given to the visitors, during which speeches are made through the medium of an interpreter and presents exchanged, the natives presenting woven grass mats, poultry, produce and grass skirts, and in turn receiving chocolate, tobacco and sweets. In the evening a native dance takes place. Dancing is the natural form of self-expression for the native, and the ancestral dances tell in their gestures the history of the race. Some of the Missions endeavour to stop the natives dancing because they consider it to have a bad influence on the race. To my mind this is entirely wrong and the natives should be encouraged to keep alive their traditional form of amusement. The natives themselves agree in this, for at one dance I distinctly heard long quotations from the Bible being sung. When I inquired the reason I was told that the Mission had stopped any dances except those officially recognized as religious ones. Therefore they had set religious words to their ordinary dances so that the Mission would recognize them as being of religious significance and accordingly permit them to take place.

Imagine a perfect tropical evening, the brilliant white moonlight striking down between the coconut palms and casting weird shadows on the coral. As the large native meeting house is approached one senses a feeling of suppressed excitement. The throbbing of a drum is heard and groups of natives with flower wreaths around their necks pass by. The meeting house is packed with natives sitting cross legged on the floor and the sole illumination is one large kerosene lamp. We take our seats and the dance commences. First the younger people come forward, the men with oiled and shining bodies decorated with greenery, and the women with their grass skirts and wreaths of flowers. They dance to the accompaniment of a wonderful rhythm evolved by about eight natives beating [illegible] of kerosene tins covered with grass mats. After [illegible] girls get up and respectfully place round [illegible] necklets and on their heads a wreath of [illegible] up and perform one of the traditional [illegible] mostly of almost interminable movements of the [illegible]

As the evening progresses the [illegible] excited and more keep joining in until [illegible] going with a swing. This being a special night [illegible] dancing until midnight; on normal evenings [illegible] regretfully we have to leave to return to the [illegible]

On the following day the island was inspected [illegible] hospital, the gaol and the various other establishments. [illegible] consists of a series of native huts well spaced [illegible] kept very clean. In the centre there is a European building [illegible] includes a dispensary and an operating theatre. [illegible] best form of hospital in the Pacific Islands, although [illegible] it would be better to build a European type of hospital [illegible] of the group at great expense. This may be more [illegible] from European standpoints, still I feel that the sick native [illegible] quickly when he is living as he has always lived [illegible] and there is no reason why the native hut should not be kept clean. [illegible] "Caretaker" system is adopted at the hospital which means that [illegible] brings his family with him and they are expected to look after him. [illegible] system is unsatisfactory in a hospital staffed with European nurses, but [illegible] very well in a native type of hospital as long as the [illegible] to one or two individuals. In this type of hospital [illegible] huts it means that there is someone with the patient [illegible] that if his disease is infectious infection is restricted to [illegible] thus limiting the spread of disease throughout the village.

The missions on the islands are predominantly Roman Catholic [illegible] met the charming French Father who has been on the island [illegible] years without a holiday. Contrary to expectation he is a [illegible] man with a most agile brain. He is building with his own hands [illegible] stone church and has established an efficient school for the native [illegible] girls. Although he himself speaks broken English and prefers [illegible] tongue, he manages to teach the natives quite good English, and [illegible] of some seven years education they are able to do simple [illegible] native then knows sufficient to obtain employment [illegible] as a clerk at a wage of about £7 a month. He remains there [illegible] saving enough to buy himself a bicycle and his wife a sewing [illegible] patch of land. Being then a retired gentleman of means [illegible] for the rest of his life in perfect contentment. The native [illegible] and the [illegible] is to take the brakes off because for some reason [illegible] without them. The French Father has a remarkable [illegible] plays stirring tunes on rather antiquated French instruments [illegible] he [illegible] his life to the care of his island flock.

The central island [illegible] which resembles Butaritari in its general [illegible]. On this island is the medical administration for the group, and the [illegible] where native medical practitioners are trained after qualifying [illegible] alone to an isolated island. They also have a modern and [illegible] all us. The hospital is well equipped with instruments and I was able to perform several operations through the courtesy of the Resident Medical Officer. The native medical practitioners are good anaesthetists although rather [illegible] the pour on and wait for the patient to wake up school, and the [illegible] systems have fairly good ideas of asepsis and other such matters. A large number of the cases in hospital suffer from yaws, although attempts are made to keep this disease under control by treating as many natives as possible with Novarsenobenzol. I recommended that a form of arsenic by mouth such as Stovarsol or a similar preparation should be given to the natives because I felt that it was unwise for intravenous injections to be given in bulk by missionaries and dressers under difficult circumstances. It was pointed out to me, however, that thousands of injections were given annually without any bad results, and I conclude accordingly that the native must have a greater immunity than the European to the toxic effects of arsenic. There were two other interesting cases in hospital: the first, a young native girl whose husband had bitten the cartilaginous portion of her nose right off because he suspected her of adultery, and presumably wished to make her unattractive to other men. The other case was more remarkable still. In a quarrel after drinking sour toddy, one native had attacked another with a knife, burying it up to the hilt in his forehead. The blade had passed to one side of the nasal septum and apparently missed most of the important structures. This did not incommode the man who was attacked, and he proceeded scientifically to cut his opponent to pieces, and inflicted such injuries that the aggressor died from his wounds. After the fight the victor was taken to hospital, and the knife was extracted by an enormously strong native policeman, who placed one foot on the man's face to obtain the necessary leverage and the other on his forehead. I saw the patient, and the only residual defect was a slight dragging of his left foot. One remarkable thing about the native is his rapid recovery from wounds. Medical officers told me of many cases of natives who had sustained wounds which in a white person must have proved fatal. These had been dressed with native muds, and had healed perfectly in a much shorter time than medical experience would believe possible. The native sometimes uses the pincer like jaws of certain insects as stitches. The insect [illegible] to take a grip of [illegible] skin edges and then his body is cut off. Their surgical instruments [illegible] razor edged sharks' teeth mounted in wooden handles, and they [illegible] preparations of native plants in their practice. I attempted [illegible] some of these were, and one native plant brought to me appeared from the description of its action to have some of the properties of Slippery Elm.

The natives at Tarawa are [illegible] would think. One night I attended [illegible] and sitting cross-legged on the floor [illegible] acted as an interpreter for me. [illegible] projection outfit of a primitive kind [illegible] and then he took it from island to island [illegible] natives. He remarked, however, that [illegible] with this, but wanted [illegible] English magazines!

From Tarawa it is [illegible] there is one of the most remarkable [illegible] in the British Empire. It is the Government "King George the Fifth School." [illegible] developed it on English Public School lines [illegible] cricket and football teams. The pupils [illegible] from various islands, and I saw many specimens of their excellent work. Of [illegible] medical interest is the headmaster's experiment [illegible] referred to in textbooks on Tropical Diseases. [illegible] of the boys lack vitamins he administers this [illegible] of the coconut tree is deliberately fermented [illegible] which produces a yeast-like fermentation. [illegible] an equal part of cod-liver oil, the resultant mixture [illegible] He told me that it did the boys a lot of good [illegible] preparing it as this meant fermenting [illegible] excellent toddy. The headmaster [illegible] fruits or vegetables grow on a coral island [illegible] unremitting attention and the importation of [illegible] from Australia he has grown a fine vegetable garden and [illegible] flowers. This struck me as an important experiment. [illegible] not take the amount of trouble involved [illegible] on these isolated islands, and thus are prone to [illegible] diseases. In a report to the administration [illegible] Gericke's work in California on growing [illegible] of chemical solution instead of soil [illegible] ducing the system to our island possessions. [illegible] Americans find that the new science of Hydroponics [illegible] rapid growth of essential vegetables, and has proved useful in the [illegible] Islands, Guam and Midway. I observed tentative experiments [illegible] gressing [illegible] at Nauru. From my own experience I [illegible] delighted [illegible] sit down at the headmaster's table and eat fresh [illegible] after being fed on tinned and refrigerated foods in the ship for a month [illegible]

The next [illegible] Abemama, was most interesting to me because of its connection with Robert Louis Stevenson. During his cruise in the *Janet Nichol* he stayed on this island for some months as the guest of King Tembinok. The old man was a tyrant who treated his people very badly. He married numerous wives and used to play cards with them each evening to win back the housekeeping money he gave them. He was enormously fat and even when Naval vessels visited the island he insisted on boarding them to grant pratique. A special sort of boarding ladder had to be constructed to stand his weight. Another of his fads was that he would never permit sails in his canoes, and so whenever this mass of flesh travelled he was pulled by sweating oarsmen, whom he kept hard at their job by threatening them with a loaded rifle. On the island I met Nei Rita, one of his surviving wives, and also his grandson, the hereditary chief of the island, and they showed me photographs of the old man, who incidentally was impotent and thus had to adopt his royal family. I was introduced to an old native called "Tikop". This old man was a great friend of Stevenson's and they, in native fashion, exchanged names, and to this day he is known as "Louis", in the same way that Stevenson was known to the natives as "Tikop". I was requested to see an old trader who desired to see a doctor, and on meeting him discovered to my joy that he had known Stevenson and had sailed with him. He described Stevenson as "pale and always talking and of a nervous disposition". He said that Stevenson must have taken drugs in some form because he would hold a tea party and wear himself out with talking and gesticulating, and then retire to his tent for a short time and come out renewed in mind and body. This poor old man is now eighty-one, and has a cancer on his left antrum which is invading the eye. He is a Master Mariner and sailed originally from England in 1882 on board the *Hereward*, a four-masted schooner carrying grain outward bound for San Francisco. He married a native girl and had two sons, one of whom was killed with the New Zealand Expeditionary Force in the last war, and who was incidentally the only Ellice Islander serving with that Force. He said that he was in San Francisco when Stevenson married his second wife, and also that the natives were very fond of Stevenson, who always wore his trousers rolled up around his knees. Tembinok, he said, was a terrible man, but he told me where he was buried. Later on I saw the grave, which has been concreted in by his descendants. At Abemama we set out in canoes to go fishing for flying fish on the reef. One stands in the prow of a canoe which is propelled through the water by about eight stalwart native oarsmen, and behind you is a sort of torch bearer. On arrival at the reef he lights the enormous coconut fibre torches, and you attempt to catch the flying fish as they go by in a net [illegible] fish. He [illegible] Another [illegible] We walked [illegible] the spiral of octopus—that [illegible] their bodies against the sand. He would then [illegible] the octopus and catch it as it attempted to swim away. His [illegible] would come out of the water covered with the struggling tentacles of the thing and he would carry it to his mouth and bite it between the eyes, thus paralysing its nerve centres. I did not essay the feat!

There are many other Gilbert Islands, among them Beru, which must be mentioned in passing as established there at Rongorongo is the School of the London Missionary Society. This is a well-organized school, and the natives are taught the useful arts and crafts as well as the English language. The principal of the Mission is a homoeopath and an amateur dentist who extracts teeth and refuses to give any form of anaesthetic, as he says that pain can be borne by the exercise of mind over matter. I understand that his dental activities are not very popular. At this school is a magnificent clock tower, the only clock to be seen in the Gilbert Islands. In the native village at Beru I saw a young frigate bird tied to a perch. The bird was being trained for flying competitions by the native Frigate Bird keeper. He holds this position by hereditary right and is supported by the village.

Whilst at the Residency I was shown photographs of the terrible drought-stricken Southern Gilbert Islands. The photographs showed coconut trees absolutely bare of foliage or of nuts. The tragedy is that the natives starve for food because once the coconut tree is killed it takes seven years for another one to grow to fruition. The Government is doing as much as it can to take rice to these Islands, but transport is so limited that I understand many natives are dying from starvation.

From the Gilbert group of Islands we went on to the Ellice Islands. These are very similar to the Gilberts but are richer in produce, thus the natives are even more happy and contented. We were given a most enthusiastic welcome at Nanumea, Vaitupu and Nukufetau. As we were landed our canoes were carried shoulder high up the beach. At Nanumea I saw a native wedding in the Mission church. This church is an enormous stone building which, although most imposing on the outside, is a mere shell inside. Apparently the natives of the different islands vie with each other as to who can build the highest church with the money they contribute to the church funds. This church was fully seventy-five feet in height and one hundred feet long. The congregation sat on grass mats on the floor. The couple were married somewhat hurriedly because the husband was a native policeman who had been unexpectedly transferred to another island and who was to take passage in the ship to his new job. The ceremony [illegible] we think [illegible] surely the most strange honeymoon [illegible] have had [illegible] both of them were [illegible] whole trip. [illegible] the island the lady's relatives [illegible] themselves [illegible] and eventually her mother [illegible] to be restrained [illegible] committing suicide and had to be [illegible] drowned [illegible] preparation. At this island I saw [illegible] case of a boy [illegible] born without arms—[illegible] he seemed quite happy and [illegible] able to feed himself [illegible] The population [illegible] regard him rather as a [illegible] As I left the island all [illegible] and I found myself swimming [illegible] back on board. We had [illegible] and [illegible] other Ellice Islands [illegible] celebrations. One of the dances very [illegible] represented [illegible] the aeroplane in the [illegible] When I asked how the natives knew of aeroplanes [illegible] the captain carried [illegible] and had told them all about the phenomenon [illegible]

Funafuti [illegible] island of the Ellice group and here I met [illegible] a most intelligent native medical practitioner. He had himself [illegible] an elephantiasis [illegible] most likeable fellow and [illegible] enjoyable fishing expedition together. He told me stories of [illegible] told me the following [illegible] the origin of the coconut.

Once upon a time [illegible] young girl who was adored by a certain man. She did not like him but he pursued her until her parents [illegible] her to marry the man [illegible] because he had so much land. On the night of her marriage [illegible] the sea to her and said [illegible] your husband's head and bury it [illegible]. She buried the head and [illegible] morning was surprised to see [illegible] where she had planted the head [illegible] and one fell off and [illegible]. She felt hungry and [illegible] opened it and found some milk inside. She went to drink this and [illegible] the three markings [illegible] the eyes and mouth [illegible] The natives regard [illegible] markings [illegible] human face and never [illegible]

[illegible] keeps the native hospital at Funafuti in excellent order and [illegible] interesting case [illegible] native [illegible] on the ship. He had fallen [illegible] tree and had [illegible]

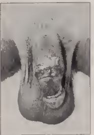
Our [illegible] Course [illegible] islands was temporarily [illegible] while we returned to Suva, the capital of Fiji.

# Clinical Notes and Cases

## [illegible] OF PENIS: RESTORATION OF TISSUE BY [illegible] FLAPS

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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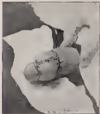
[illegible]



[illegible] raft of thigh treated similarly and completing [illegible] of raw area.

[illegible]

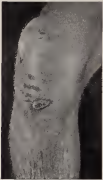
## A CASE OF [illegible]

By [illegible]

[illegible]

[illegible]

lymphoid [illegible] the tonsils as being easily [illegible] [illegible] the phalanges and (1) a negative [illegible] He states [illegible] (1) or (2) with typical [illegible] pathogenic.



[illegible] on the knee [illegible]

[illegible]

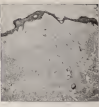


Fig. 2.—Section of skin

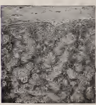


Fig. [illegible]—Section of lymph gland

[illegible] metals, bismuth, mercury [illegible] by mouth and organic [illegible] found very good results using [illegible]

## DISCUSSION

[illegible] of cause of the malady [illegible] the French [illegible] in 1934. [illegible] both human and bovine [illegible] which lies between [illegible] and *B* [illegible]

Most [illegible] is being, the onset, the resulting syndrome [illegible] peculiar to the patient. Occasionally [illegible] cases have been reported in which [illegible] developed, but a very important point [illegible] the features of benign lymphogranulomatosis [illegible] that the two conditions cannot exist [illegible] very strong argument in favour of the [illegible] of both diseases, the resulting [illegible] reactions. A very interesting [illegible] (1921) [illegible] was able to stain acid-fast [illegible] was negative and [illegible] had disappeared. He thought [illegible] On the other hand [illegible] (1924) [illegible] that Kyrle's patient was [illegible] really had the disseminated [illegible] produced a local reaction in the [illegible]

[illegible] difficult to explain on the theory [illegible] that it is due to positive [illegible] that the serum of these patients [illegible] which [illegible]

[illegible]

[illegible]

[illegible] probable that this [illegible]

[illegible] for his permission to publish [illegible] the histological [illegible] for the micro[illegible] for the photograph.

### REFERENCES

[illegible] 17 [illegible]
[illegible] 135, [illegible]
[illegible]
[illegible] 136, [illegible]
[illegible]
[illegible] 35, [illegible]

# REPORT ON A [illegible]

By [illegible]

The [illegible] which is [illegible] only [illegible] other features which [illegible].

*History.*—The subject [illegible] aged 22 [illegible] the day of the [illegible] brushwood [illegible] on the side of a [illegible] bank. Part of the [illegible] collapsed and he fell [illegible]. He appeared to be winded [illegible] and did not seem to have sustained any serious [illegible]. [illegible] he reported sick at 2000 hours [illegible] of pain in the left hypochondrium [illegible]. He [illegible] hospital and when seen [illegible] given [illegible] the abdominal pain which was becoming [illegible]. He [illegible] on the following morning his condition [illegible] with [illegible] the severity of the abdominal pain. He [illegible] transferred [illegible] hospital. His condition here steadily [illegible] and at 1500 [illegible] asked to see him.

*Physical Condition.*—He [illegible] extremely ill [illegible]. He was restless [illegible] of generalised abdominal pain and [illegible] in the left shoulder. His pulse [illegible] was 160 and was feeble in volume. [illegible] with shifting dullness [illegible]. The [illegible] but more marked [illegible]. [illegible]

*Operation.*—[illegible] of distension [illegible].

[illegible]

Subsequent [illegible]

On [illegible]

[illegible]

*Discussion.*—[illegible] of the [illegible]

(1) The [illegible]

(2) [illegible] of the [illegible] of that [illegible]

(3) The [illegible] as the [illegible]

(4) [illegible] of the haemorrhage, has been [illegible] of these cases is surprisingly [illegible]

(5) [illegible] can be had on the [illegible] suspected [illegible]

(6) [illegible] of a case of a [illegible] until control [illegible]

## CAVERNOUS SINUS THROMBOSIS

By [illegible] CRAIG, R.N.

[illegible] R.M. [illegible] stable previous to admission [illegible] Hospital [illegible] July [illegible] had suffered from [illegible] for [illegible] The day before admission he had severe pain [illegible] right [illegible] and the [illegible] had [illegible]

On [illegible] acute dermatitis of the right [illegible] and [illegible] which was swollen [illegible] so that [illegible] could not be obtained. There was [illegible] a small [illegible] He had pre- and post-[illegible] His temperature was [illegible] pulse 84. His nose [illegible] No cervical [illegible]

[illegible] is given [illegible] packs applied [illegible]

[illegible] the [illegible] from [illegible]

[illegible] pulse 100 [illegible] His temperature fell to [illegible]

[illegible] On September [illegible] 99.8 [illegible] to get [illegible] He [illegible] only [illegible]

On September [illegible] to 100.2 [illegible] pulse [illegible] slight cough with expectoration [illegible] given an [illegible] at night.

On September [illegible] temperature 103 to 102.6 [illegible] pulse [illegible] respirations 28/28. [illegible] Cough frequent and dry. [illegible] passed [illegible] 20 ounces yesterday [illegible] mentally confused. Blood was taken for culture.

September 2[illegible] [illegible] and his facial muscles were twitching. Respiration [illegible] and deep. Pulse 130, temperature 105° F. Pupils were contracted [illegible]

At 0900 [illegible] amount of fæces [illegible] pared culture [illegible] contained [illegible]. During the day [illegible] became weaker and [illegible]

## POST-MORTEM EXAMINA[illegible]

Skull. Meninges [illegible]. Not unduly [illegible] fection. On [illegible] from an area of the [illegible] the side of the [illegible] was bound [illegible] was removed [illegible] small [illegible] either side [illegible] her side resulted in the [illegible] were taken. The [illegible] either side [illegible] basal and lateral sinuses [illegible] ection. The superior ophthalmic veins [illegible] but no pus in the orbit [illegible] temporal was then examined, no pus [illegible] on stripping the dura. The right [illegible] d the procedure of a conservat[illegible]. There was no frank pus present in the [illegible] contain a clear serous fluid from [illegible] d removal of the bony bridge [illegible] frank pus and small [illegible] posure of the lateral sinus [illegible] infection to either of these structures [illegible] traces of several furuncles from [illegible] the deep tissues about the [illegible] cells and sphenoidal sinus [illegible] was re confirmed [illegible] exploration revealed that the right [illegible] squamous [illegible]

The Brain. No signs of meningitis. N[illegible] ventricles. No signs [illegible] A D. Basal of Brain—[illegible] was not [illegible] possible [illegible] revealed by delivery of the [illegible] N A D.

*Conclusions.*—(1) N[illegible] auditory meatus [illegible] transverse sinuses) w[illegible] petrosal sinuses [illegible] of the [illegible] thrombosis of the communicating veins.

(2) There was [illegible] and a communi[illegible] plexus of [illegible] cavernous sinus through the [illegible] the passage of infection.

Death due to [illegible] was the [illegible]

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## AN INTRAVENOUS SET FOR SMALL SHIPS

By Surgeon Lieutenant L. S. ANDERSON, R.N.

Noticing that the possibilities of intravenous "drips" may not have been as fully exploited in small ships as they might have been prompts the following description of the system which has been employed in H.M.S. *Fleetwood* since just before the Norwegian Campaign.

It had been intended in order to increase the scope of the gear to group the whole Ship's Company on board as, although there was already a roster of voluntary donors in existence, it was felt that this might prove to be inadequate after action when so many of the "Group O" donors might themselves be casualties or else be occupied in the essential work of keeping the ship a fighting unit. Early in April, however, Dr. C. P. Stewart, in charge of the East Scottish Blood Transfusion Service, very kindly offered to group the Ship's Company. The blood samples were taken on board one morning and the results arrived the same afternoon. The following were the group percentages which may be of interest:

| | | |
|---|---|---|
| Group AB | (Moss I) | 7% |
| A | ( II) | 42% |
| B | ( III) | 12% |
| O | ( IV) | 42% |

Now, with every man's factor stamped on his Identity Disc (A.F.O. 2810 A/39) a suitable donor could readily be found under any conditions of stress or strain.

*Description of the Apparatus.*—No novelty is claimed for any part of the gear used, as it is essentially a modification of that in use at one or other of the Voluntary Hospitals ashore. However, for use in small ships it had to be very compact for transportation, to be easily and quickly erected in any part of the ship or ashore on a landing party, and to be so simple that the setting up could be done by anyone who had never seen it before. Moreover, it had to be capable of giving any possible fluid or combination of fluids, because there was no room for adaptation of the apparatus. These points were put to the test in Norway, where it was used on four occasions on the Mess Decks, the setting up being done by one of the stokers.

A [illegible] mouth gin bottle was taken as the reservoir on account of its ubiquity, which is important when [illegible] may occur far away from any source of supply, and of their glassware. The only special [illegible] the dripmeter, which being small is easily stored in safety.

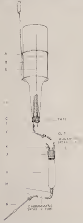
Diagram 1 shows the apparatus:

(A) A piece of wire sling for suspending gin bottle.
(B) The Reservoir. Plain mouth gin bottle holding 700 c.c. to the base of the neck [illegible] diameter.
(C) [illegible] rubber stopper.
(D) [illegible] $\frac{1}{4}$ in. bore, $12\frac{1}{2}$ in. long.
(E) [illegible] tube, $\frac{1}{8}$ in. bore, 3 in. long.
(F) Monel Metal Mesh filter with strip of tape or bandage to secure it to the stopper.
(G) Rubber tubing, $\frac{1}{8}$ in. bore, leading from the short glass tube to the dripmeter and controlled at the lower end by a gate clip.
(H) The dripmeter, a glass cylinder $\frac{3}{4}$ in. in diameter and 4 in. long with a nozzle at the lower end.
(J) Rubber stopper, same as (C), through which pass two glass tubes $\frac{1}{8}$ in. bore and 3 in. long.
(K) Short rubber [illegible] tube fitted with a gate clip.

(L) Glass tube to which tube (G) is attached.

(M) Rubber delivery tube $\frac{1}{16}$ in. bore and about 3 ft. [illegible]

(N) Hamilton Bailey's silver gilt canula. This canula [illegible] preference [illegible] it is felt that the [illegible] of trauma to the [illegible] and the resulting fr[illegible] from clotting [illegible] small extra [illegible] in operation is compared with [illegible]



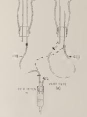
[illegible] —(1) Suspend the gum bottle filled [illegible] citrated blood, gum saline, [illegible] [illegible] by [illegible]

[illegible] the vein

[illegible] up the whole system and fill the dripper [illegible] (H) [illegible] the delivery tube (M) and opening clip (K) slightly.

[illegible] (K)

[illegible] Expel air from the system by simply hanging [illegible] [illegible] will happen in the dripper [illegible]



[illegible] through the [illegible] the [illegible]

[illegible] the flow [illegible] by [illegible] the level of the fluid in the dripper [illegible] clips (G) and (K). Open [illegible] slightly and the [illegible] and open (K) and the level will fall. This is made [illegible] without checking the flow of fluid to the vein [illegible] the [illegible] Tube (G) [illegible] its own [illegible] and when its gate clip is closed no [illegible] drops of fluid will escape from the short glass tube of the new [illegible] the rubber [illegible] over, no matter how slowly this [illegible]

[illegible]

[illegible] takes up 700 c [illegible]

label (two plain [illegible]) [illegible] vertical [illegible]

These [illegible] for an additional [illegible] light [illegible]

[illegible]

(4) On [illegible]

(a) [illegible]

(b) [illegible]

It will be seen from [illegible] system and [illegible]

[illegible] found [illegible]

[illegible] probably [illegible]

I wish to express [illegible] H.M.S. [illegible] work properly.

In conclusion the [illegible] system [illegible]

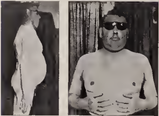
[illegible] diameter [illegible]

## CUSHING'S SYNDROME [illegible]

By Surgeon Lieutenant N. H. M. A[illegible]

One [illegible] spect to find many [illegible] of [illegible] the Service. The following two cases which [illegible] [illegible] [illegible] Cushing's Syndrome [illegible]

[illegible]



[illegible]

[illegible]—Height [illegible] ft. 6 in., weight 12 st. [illegible] appearance [illegible] of the shape [illegible] full [illegible] as if he had been [illegible] the [illegible] of a blusher [illegible] but it is [illegible] and rounded in contour. [illegible] The eyebrows are well formed and [illegible] and the lower [illegible] neck is [illegible] and the supraclavicular spaces [illegible] fatty tissue [illegible] suprasternal [illegible] of fat generally and especially over the shoulder [illegible] wall and axillæ. The abdomen [illegible] hanging in [illegible] There are [illegible] in pregnant women [illegible] and they [illegible] lower part of the abdomen [illegible] loins, shoulders [illegible] symmetrically. [illegible] worthy [illegible] the [illegible] irregularly [illegible] the trunk [illegible] are [illegible]

*Hair and [illegible]* [illegible]

[illegible] no other abnormality.

*Investigations.* [illegible] excretion of [illegible] understood that [illegible] were [illegible] The figures were [illegible] the normal proportion. [illegible] sugar [illegible] 0.0 [illegible] 0.15 [illegible] fallen [illegible] 0.10 [illegible]

X-ray examination [illegible] in the pituitary fossa [illegible] appearances were normal.

Summary.—[illegible] is the [illegible]

(1) The [illegible] appearances.

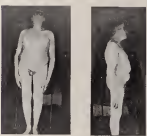
(2) The obesity [illegible] principally on the [illegible] abdomen.

(3) The [illegible] the bulging [illegible] suggesting a [illegible] function.

[illegible] ges and ecchymoses on [illegible] pressure.

[illegible] Syndrome [illegible] sex ch[illegible] the sex [illegible]

[illegible] 40 [illegible]



[illegible]

[illegible] He has [illegible] until the [illegible] He has [illegible] absent but he has [illegible] development [illegible]

[illegible]—Height 5 ft. 5 in., weight 12 st. [illegible] appearance like that of a fat boy. [illegible] average intelligence. [illegible] the trunk [illegible] lips and [illegible] In striking contrast to the trunk [illegible] The length of the upper [illegible] than the patient's height. [illegible] the lower 34 in.

*[illegible]*—The scalp is cov[illegible] well developed. [illegible] the [illegible] the size of the small [illegible] The [illegible] is not enlarged. [illegible]

[illegible] following [illegible] Wassermann [illegible]

[illegible]

1) [illegible]

2) [illegible]

3) [illegible]

I am indebted to Surgeon Rear-Admiral [illegible] for permission to report this case; to Surgeon Commander [illegible] R.N.V.R., for [illegible] and to Surgeon Commander [illegible] R.N.V.R., for the accompanying photographs.

[illegible]

## INVESTIGATIONS INTO THE ETIOLOGY OF INFECTIVE HEPATITIS AT ALEXANDRIA IN THE AUTUMN OF [illegible]

[illegible]

[illegible]

| Name | Ship | Gram | motility | Lactose | Glucose | Mannite | Maltose | Raffinose | Saccharose | Peptone water | Bacterial diagnosis | Confirmed by serology | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] (11) | — | — | | A | A | A | A | — | * | Flexner | Yes | Acid in raffinose slight in 24 hours but definite at 48 hours |
| [illegible] | [illegible] (Lebbe lan) | | | | A | A | A | | A | * | Flexner | No | Confirmed by Dr W. M. [illegible] agree with diagnosis |
| [illegible] | [illegible] | | | | A | A | A | A | | * | Flexner | Yes | Acid in raffinose at 48 hours |
| [illegible] | [illegible] | | | | A | A | A | A | — | * | Flexner | Yes | |
| [illegible] | [illegible] | | | | A | A | A | A | | * | Flexner | Yes | Acid in raffinose slight in 24 hours but definite at 48 hours |
| [illegible] | [illegible] | | | | A | A | A | A | A | * | [illegible] | [illegible] | |

[illegible] these few cases are :—

1. [illegible] (M. 75) is seen on the [illegible] Station [illegible] Malta tummy [illegible]) of which [illegible] the lead [illegible] bacterial infection [illegible] be isolated in the stool.

2. [illegible] these lines [illegible] to be useful in [illegible] these mild cases [illegible] enteritis and [illegible] of specific prophylaxis, although the identity [illegible] confirmed.

3. [illegible] brought to [illegible]

## AN OUTBREAK OF FOOD POISONING.

By [illegible] IAN MACDONALD, M.D., M.B. [illegible]

[illegible] in the Navy, and it is thought that an account [illegible] in one of H.M. Ships at sea may be of interest. [illegible] food poisoning refers to the infection of food [illegible] toxins, and in the great majority of cases the food shows [illegible]

[illegible] usually belong to the Gaertner or Salmonella group [illegible]. The poisoning is due to the toxins produced by [illegible] the organisms themselves invade the blood [illegible] destroyed by heat, but the toxins are very [illegible]. [illegible] present instance, the food is tinned, the toxins [illegible] food when canned, and are not destroyed in the [illegible] climate, as in the present instance—85° to [illegible] left after opening for ten hours, the development [illegible] to be rapid, and the symptoms correspondingly [illegible]

[illegible] hours after breakfast five ratings became sud[illegible] pain, vomiting, severe purging, and collapse. [illegible] who had breakfasted one hour after the previously [illegible] of the Mess were similarly affected.

[illegible] tinned salmon had been used to make fish [illegible] breakfast that morning. The contents had [illegible] had been thrown overboard. No other likely [illegible] member of this particular mess had the [illegible]

[illegible] complained of [illegible] abdominal pain, and there was [illegible] diarrhoea. There was a severe degree of collapse [illegible] sweating, and a pulse of low tension. In two [illegible] perceptible, and in a third [illegible] became very [illegible] following oxygen and adrenalin there [illegible]. Vomiting and purging persisted for four or five hours with [illegible] effect. Stools became mostly mucous [illegible] cholera-like cramps [illegible] patients was several times. Blood [illegible] passed per rectum.

[illegible]

[illegible] consisted of warmth, fluids and stimulants, adrenalin [illegible]. When collapse was most severe, intravenous saline [illegible] improvement. Those with muscular cramps responded

[illegible]

◆

## Correspondence.

[illegible] JOURNAL OF THE ROYAL NAVAL [illegible]

Sir,—[illegible] [illegible] rarity of [illegible]

The patient [illegible] of 22 [illegible] of herpes of [illegible] course as [illegible]

First blister [illegible] the sterno [illegible] two weeks [illegible] October [illegible]

On examination [illegible] good physique [illegible] tions which might [illegible] the history that [illegible] in spite of [illegible] is psychological [illegible] investigate [illegible] birthday is in October [illegible]

There [illegible] or four times [illegible] injury.

The family history [illegible] gastric [illegible] and well. [illegible] except the patient.

I would be ver[y] [illegible] nature before [illegible]

[illegible]

H.M.S. [illegible]

[illegible] March 28, 1940 [illegible]

[illegible] gypsum [illegible]

[illegible] R.N.M. Vol. XXXIII, No. [illegible]

[illegible] this [illegible] since the [illegible] the Naval Forces [illegible] What results [illegible] to the [illegible]

I am, Sir,

Yours, &c.,

[illegible]

Surgeon Lieutenant, R.N.

[illegible]

[illegible] 1941.

◆

# Reviews.

[illegible] FEVER. By Denis Brinton, D.M.Oxon., F.R.C.P.Lond., Physician in charge of the Department for Nervous Diseases, St. Mary's Hospital, London; Assistant Physician to Out-patients, National Hospital for Nervous Diseases, Queen Square [illegible] 1941. [illegible] Pp. 163. Price 8s. 6d.

[illegible] generation [illegible] the appearance of [illegible] the publication [illegible] monograph on the subject [illegible] place with regard to treatment. We [illegible] this little book [illegible] distinguished [illegible] serving [illegible] Medical Service. Dr. Denis Brinton [illegible] the practical [illegible] bibliography [illegible] of some of the [illegible] treatment [illegible] effects. [illegible] R.N. Hospital [illegible]

[illegible] possibly [illegible] book from [illegible] [illegible] photographs [illegible] The [illegible] tion [illegible]

[illegible]

[illegible] Spottiswoode London [illegible]

This book is one of the [illegible] It contains five chapters dealing [illegible] spinal cord abdomen and chest [illegible] on the prophylactic and therapeutic [illegible] All have appeared in the *Practitioner* during the [illegible] the first four chapters deal with [illegible] each presented by an expert [illegible] his readers advice based on [illegible] special difficulties that this [illegible] is still being written on burns [illegible] The appendix on the use of sulphanilamide [illegible] Among the spate of books, articles [illegible] on the subject of war surgery this [illegible]

H. F. B.

SURGERY OF MODERN WARFARE. Part III. [illegible] Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital, London, &c. Compiled by sixty-five contributors. Section IV (continued)—Wounds of the Blood Vessels. Section V—Peripheral Nerve Injuries and Wounds of Tendons. Section VI—Methods of Immobilizing the Limbs. Section VII—Wounds of the Hand and Foot. Section VIII—Wounds of Bones and Joints. First Edition, January, 1941. Pp. 120, [illegible] illustrations, several of which are in colour. Edinburgh: E. & S. Livingstone. Price 12s. 6d. net.

The high standard attained in the [illegible] parts of this book is again fully maintained. [illegible] conservative [illegible] The [illegible] The use of this [illegible] may well prove a great [illegible] intravenous [illegible] If the [illegible] lives may [illegible] any diffi[illegible] immobilizing limbs [illegible] applying extension [illegible] frames the [illegible] splint and [illegible] and the [illegible] plaster [illegible] from the text [illegible] well chosen and particularly helpful. Wounds [illegible] chapter. The authors [illegible] Sheffield [illegible] years of special [illegible] industrial

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] the [illegible]

Further [illegible] by the [illegible] lastly the [illegible]

This [illegible]

[illegible]

FRACTURES [illegible] Orthopaedic [illegible] Pp [illegible] Illustrated [illegible] London [illegible]

This [illegible] The author [illegible] signs and [illegible] confined to the [illegible] ing occupy the [illegible] a lecturer to [illegible] ence and for [illegible] been [illegible] to replace standard [illegible] addition to the library [illegible] emergency or otherwise

H F B

FRACTURES AND [illegible]

[illegible] Royal [illegible] Medical [illegible] Orthopaedic [illegible] University [illegible] Illustrated [illegible]

With less than [illegible] been [illegible] April [illegible] subject [illegible] [illegible] blood and [illegible] plast [illegible] technique of a [illegible] with the [illegible] and other requirements. The [illegible] ons [illegible] requirements [illegible] by an English author. It is [illegible] that it will [illegible]. The printing and illustrations [illegible] that high standard [illegible] with which the name of E. & S. Livingstone is always associated.

H. F. B.

ESSENTIALS OF GENERAL ANAESTHESIA WITH SPECIAL REFERENCE TO DENTISTRY. By R. R. Macintosh, M.A., M.D., F.R.C.S.E., D.A., Nuffield Professor of Anaesthetics, University of Oxford, and Freda B. Pratt, M.D., D.A., First Assistant, Nuffield Department of Anaesthetics, University of Oxford. First Edition 1940. Pp. xii + 384. Illustrations 216, of which many are in colour. Oxford: Blackwell Scientific Publications Ltd. Price 25s. net.

This book is based on a series of lectures given to students at the Dental School of University College Hospital, London, and the University of Oxford Medical School. The fact that special reference is made to dentistry in no way detracts from its value as a textbook of instruction for the understanding of problems likely to be met with in anaesthesia for operations on other parts of the body. Few medical men have the opportunity of seeing or practising the refinements of anaesthesia required for operations on the mouth. Many practical hints therefore have been incorporated in this book which cannot do otherwise than help the general practitioner with limited experience. The whole subject is dealt with in a most thorough and systematic manner with a profusion of excellent illustrations. The book commences with a brief but interesting summary of the history of anaesthesia to which a useful bibliography is appended. Then follow chapters on respiration, cyanosis, signs of anaesthesia, premedication, barbiturates, ethyl chloride, Vinesthene, ether, chloroform and nitrous oxide, &c. Those on endotracheal anaesthesia, mouth gags and props, respiratory obstruction and emergency are particularly helpful. The final chapter deals with the legal aspects of anaesthesia. A most instructive presentation volume which will assuredly be of help to all those who have to undertake the responsibility of giving anaesthetics.

H. F. B.

MEDICAL DIAGNOSIS. A PRACTITIONER'S HANDBOOK. Edited by Sir Humphry Rolleston, Bart., *G.C.V.O.*, *K.C.B.*, M.D., D.Sc., F.R.C.P., and Alan Moncrieff, M.D., F.R.C.P. First Edition 1940. Pp. 286. 49 illustrations. London: Eyre and Spottiswoode Ltd. Price 12s. 6d. net.

This is the fifth volume of the series of publications which Messrs. Eyre and Spottiswoode issue in conjunction with the *Practitioner*. The standard of the whole series has been a high one and the present volume is a worthy addition. The [illegible] is remarkable and has resulted in the production of a work of the greatest practical utility and value. The whole field of diagnosis has not been covered. This was not the intention of the Editors, whose object it was to [illegible] a concise handbook. The subjects chosen are those which experience has shown to present difficulties to the General Practitioner. There are in all twenty articles, the first nine dealing with clinical diagnosis and the remainder with laboratory and special diagnosis. In Part 1 [illegible] kept as in the diagnostic significance of the knee jerk, facial [illegible] symptom and the tongue, changes in the nails as an aid to diagnosis, pains in the head and neck, abdominal pain, &c. In Part 2 the [illegible] laboratory and special methods of diagnosis are explained.

[illegible] in their proper pl[illegible] plan [illegible] in the diagrams [illegible] [illegible] from [illegible] diabetes [illegible] Most of the [illegible] the [illegible] few [illegible] the authors [illegible] and [illegible] the subject [illegible] are [illegible] points [illegible] the production [illegible] with the [illegible] [illegible]

H [illegible]

Illustrations of Regional Anatomy. By E. B. Jamieson, M.D., Senior Demonstrator and Lecturer, Anatomy Department, University of Edinburgh. [illegible] Edinburgh: E. & S. Livingstone. [illegible] 36s. [illegible]

These illustrations of Regional Anatomy [illegible] and have proved so useful that further praise [illegible] superfluous. This is the third edition, which follows its predecessor [illegible] over three years. Once again [illegible] colour [illegible] Three hundred and [illegible] colour blocks have been prepared for this [illegible] plates in the [illegible] others enlarged to full size. [illegible] over twenty-five [illegible] and four have attained the [illegible] shown in addition to the [illegible] additions have enhanced the usefulness [illegible] firmly established [illegible]

H. F. B.

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# News of the Service.

## MEDICAL DIRECTOR GENERAL OF THE NAVY

Surgeon Rear-Admiral Sheldon F. Dudley, C.B., O.B.E., M.D., F.R.C.P., F.R.S., K.H.P., has been appointed Medical Director General of the Navy in succession to Surgeon Vice-Admiral Sir Percival T. Nicholls, K.C.B., F.R.C.S., K.H.S., from July 2, 1941.

## ADMIRALTY ORDERS

### 104.—Officers and Men Brought Forward for Medical Survey as to Fitness for Further Service

(M.D.G. 477/40.—9.1.1941.)

The [illegible] laid down in A.F.O. 3404/40 regarding consideration for employment of officers and men found unfit for general service do not apply to cases of tuberculosis. All cases of tuberculosis are to be invalided in accordance with Instructions for R.N. Hospitals, Article [illegible], paragraph 13.

### 114.—Ratings on T.124X Agreement—Hospital Stoppages

(N. 10387/40.—9.1.1941.)

Their Lordships have decided that hospital stoppages at the rates and under the conditions laid down in Article 1480, King's Regulations and Admiralty Instructions, are to be chargeable against ratings on T.124X Agreement.

## [illegible]—W.R.N.S.—Medical Arrangements.

(M.D.G. [illegible]/41.—[illegible].1941.)

[illegible] the medical arrangements for W.R.N.S. [illegible] the resources of the Naval Medical [illegible] [illegible] nursing and medical [illegible] required. Wherever a Naval Medical Off[illegible] [illegible] Agent [illegible] be utilised.

[illegible] Gynaecology [illegible] appointed as follows:—

[illegible]—M[illegible] [illegible], Esq., F.R.C.S., M.R.C.P. [illegible] Welbeck 4[illegible].)

[illegible] A. [illegible] Bel[illegible], Esq., F.R.C.S., F.R.C.O.G. [illegible] (Telephone—[illegible].)

[illegible] N. [illegible], Esq., F.R.C.S., F.R.C.S. [illegible] [illegible] Edinburgh [illegible].)

Applica[illegible] [illegible] should be sent to Medical Officers [illegible] Medical [illegible].

[illegible] accommodation should be discussed with the [illegible] Naval Medical Officer and [illegible] the services of the Naval Health Officer of the [illegible] should be sought.

[illegible] Naval Medical Officer is responsible for the treatment of members of W.R.N.S. [illegible] the establishment. Where [illegible] the Principal or Senior Medical Officer is to nominate [illegible] Naval Medical Officer as Medical Officer [illegible] W.R.N.S. personnel in the district. [illegible] if possible be a general practitioner [illegible] particularly in the treatment of women.

The [illegible] Medical Officer so nominated should be reported to the Medical Director-General [illegible] Principal or Senior Medical Officer [illegible] any subsequent changes.

In order that [illegible] should not be changed except for urgent reasons.

5. [illegible] sick members of W.R.N.S. [illegible] and in some cases sick quarters [illegible] in the charge of Medical Officers and Nursing Sisters and [illegible] as and when they are deemed to be required. Cases will also be admitted to Naval Hospitals where practicable.

6. Wh[illegible] and [illegible] Nursing [illegible] Queen Alexandra's Royal Naval Nursing Service [illegible] V.A.D. [illegible] W.R.N.S. sick [illegible].

7. Medical Officers [illegible] W.R.N.S. [illegible] render a weekly return to the Medical Director-General shewing the number of patients admitted under treatment, discharged, &c., under headings of various diseases.

8. Any difficulties in connection with the medical arrangements of W.R.N.S. should be reported through the usual channels to the Medical Director-General.

## 177.—Form M.234—Application for the Supply, etc., of Dentures at the Public Expense.

(M.D.G. 4[illegible]/40.—9.1.1941.)

Form M.234, Application for the supply, &c., of dentures at the public expense, should [illegible] be prepared until the construction, &c., of the appliance can be proceeded with.

2. At Naval dental centres where dental laboratories are established the issue of Form M.234 may be dispensed with provided:—

(a) That the Senior Dental Officer is satisfied as to the man's eligibility for a gratuitous issue.

(b) That the supply can be effected before the man leaves the establishment.

(c) That a receipt for the supply, &c., is given on Form M.2[illegible] or M.2[illegible].

## 2[illegible]0.—Vitamins in the Naval Diet—Sufficiency of.

(M.D.G. [illegible]/41.—16.1.1941.)

Probably as a result of reading articles which appear in the lay press from time to time doubt has frequently been expressed as to the sufficiency of the vitamin content of the Naval Diet. Many of these articles are of a purely propaganda or advertising nature [illegible] at making the public "Vitamin Minded."

2. Since the outbreak of war the naval diet has received the closest investigation by experts both inside and outside the Service. The diet which is kept under constant review [illegible] [illegible] by the [illegible] scheme.

[illegible] standard [illegible] purposes other than [illegible] was so [illegible] and [illegible] the [illegible] of the [illegible] the [illegible] all [illegible] officer [illegible] repressing in person [illegible]

[illegible] small part of the [illegible]

[illegible] and [illegible] to [illegible]

[illegible] H.M.S. [illegible]

[illegible] of the Admiralty [illegible]

### 381.—R.A.F. Personnel—Rendering of R.A.F. Form 38—Weekly Sick Report

(M.D.G. 2800 [illegible])

In the interests [illegible] as required by C.A.F.O. 38 [illegible] R.A.F. personnel are borne [illegible]

2. [illegible] Shore Establishments.

### 391.—Sick Berth Petty Officers Efficiency Medal

(N. 14390/40.—9.1.1941.)

The Sick Berth Petty Officers Efficiency Medal for 1940 has been awarded to Sick Berth Petty Officer Walter Mark Mummery, official number C.M. 3807.

2. Sick Berth Petty Officers of the [illegible] for the award of the medal for 1941 for the [illegible] ending 1940.

3. The method of forwarding recommendations is published in the [illegible] Navy List, page 17, of the December 1940 edition.

4. It is not practicable under present war conditions for the [illegible] gold. It has accordingly been decided to issue a bronze medal with [illegible] the medal has been awarded, but name of bearer[illegible] in gold ever[illegible] purposes.

### 378.—M.180 Index Card—Neuro-psychiatry Department

([illegible] 10.—3.1.1941.)

The above form, hitherto produced locally or printed specially, has been added [illegible] copies will shortly become available when an initial distribution to all [illegible] will be made without demand from the R.N. Store Depot [illegible] S.E.8.

### 392.—Medical Officers—Allocation to Temporary Duty Locally after Sick Leave

(C.W. [illegible]—10.1.1941.)

Cases have frequently occurred of Medical Officers [illegible] being [illegible] after a period of sick leave and who are without an appointment [illegible] instructions as to disposal.

2. In future such officers are to be retained locally for temporary [illegible] or [illegible] are conveniently discharged to the nearest Royal Naval Barracks (Chatham, Portsmouth or Devonport) for temporary duty pending a further appointment, an early report being forwarded to the Medical Director General of the [illegible] employment [illegible]

### 393.—Professional Examination for Warrant Wardmaster—July 1940

(C.W. M.D.G. 44258/40.—20.1.1941.)

With reference to A.F.O. 4601/40 promulgating the result [illegible] Warrant Wardmaster

Professional [illegible] in July 1940 the following should [illegible] theses —

L [illegible] S B P O P/M 57909 serving at R N Hospital [illegible]
Marks obtained

| | | |
|---|---|---|
| | Part I | [illegible] marks |
| | Part II | 180 marks |
| | Part III | [illegible] marks |
| | Part IV | [illegible] marks |
| Total | | [illegible] marks |

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### 418.—E M S Auxiliary Hospital for Diseases of the Eye.

(M D G 46117 40 —30 1 1941)

A convalescent hospital for the treatment of eye diseases has been opened by the War Organization of the British Red Cross Society and the Order of St John of Jerusalem for the Emergency Medical Services of the Ministry of Health at —

The Zachary Merton Home
Holly Lane
Banstead Surrey
Telephone No Burgh Heath 62.

The hospital will receive cases of disease or injury of the eyes in subacute [illegible] or [illegible] stages. The types of case with which it is presently intended [illegible] are the following —

1) Inflammatory diseases of the lids or eyes
(a) Blepharitis conjunctivitis kerato-conjunctivitis when extended [illegible] necessary for alleviation or cure of the condition
(b) Corneal [illegible] ulcers
[illegible] chorio-retinitis [illegible] changes [illegible]
(2) Post traumatic and post operative cases of all types (including [illegible] the eye (particularly with infected sockets) until a prosthesis [illegible]
[illegible] operations [illegible] including [illegible]
[illegible] all types and [illegible]
[illegible]

[illegible] Naval ratings and applications [illegible] the case may be made direct by Medical [illegible] R N Hospitals [illegible] Command [illegible]

### 421.—Custody of Medical History Sheets of Ratings in Small Ships

(N M [illegible] 1712 40 [illegible])

[illegible] to A F [illegible] 1208 [illegible] it has been decided that [illegible] arrangement [illegible] the custody of Medical History Sheets [illegible] ratings serving [illegible] being sent from the Depot [illegible] only when the rating [illegible] Naval [illegible] quarters

[illegible] regarding other sickness should be reported to the Depot or Base [illegible] be made in the Medical History Sheet

### [illegible].—Carbon Monoxide Poisoning—Examination of Blood Specimens in Suspected Cases

(M D G 2445 41 — 6 2 1941)

[illegible] view of the necessity of accurate diagnosis an examination of the blood of the [illegible] should whenever practicable be made in all cases of suspected carbon monoxide [illegible] but specimens of blood are not to be taken from civilian employees without [illegible] consent first being obtained. These examinations are to be carried out at the Royal [illegible] Medical School White House Haslar [illegible] where special [illegible] for the purpose

[illegible] carbon monoxide is rapidly excreted from the blood after the patient [illegible] the [illegible] specimen in duplicate should be taken [illegible] possible [illegible] with [illegible] attention the [illegible]

[illegible] of blood (about [illegible]) should be extracted [illegible] distilled [illegible] the tube [illegible] should be [illegible] specimen [illegible] the specimens should be protected from light, kept [illegible] possible. With proper precautions such specimens will [illegible] weeks.

[illegible] The specimens are to be accompanied by a complete [illegible] which is to include information as to the time which [illegible] from the poisonous atmosphere and the collection [illegible] patient as it leaves similar [illegible]

[illegible] The specimens and all information concerning [illegible] Officer in Charge, R.N. Medical School, White House, [illegible]

## 619.—Medical Organisation for Action—

(Distributing Stations, First Aid P[illegible])

*H.M. Ships, Cruisers and a*[illegible]

(M.D.G. 14385/30.—13.2.1931)

1. The light of war experience it has been decided that [illegible] such [illegible] (e.g. cruisers and above) the medical [illegible] more stations and that in future positions suitably selected [illegible] be carried out.

2. These positions are to include, wherever possible:—

(a) The *Main Distributing Station* (Main D.S.) [illegible] in a compartment under protection [illegible] ship's flow and if possible appropriated [illegible] purpose.

(b) An *Auxiliary Distributing Station* (Auxiliary D.S.) [illegible]

[illegible]

Space.

[illegible]

[illegible]

Absorbent cotton wool
Gauze
Impervious bottles
Lint plain
Lint boric
Lint picric
Safety pins
Dettol
Spirits meth
Morph hypo solution in 1 oz rubber cap bottle
All glass hypodermic syringe
Splints common wooden
Pair scissors
Pair dressing forceps
Pair Spencer Wells
Scalpel
Anti burn jelly
St[illegible] tourniquets
First field dressing
Sterile swabs to be replenished frequently
Ligatures
Red [illegible]
Goose neck

[illegible] (d) A percentage of the [illegible] stores supplied for [illegible] to use lamps will be in basket or other similar material
[illegible] 1 A F O 2711 [illegible] of pocket torches and of parts [illegible]

[illegible] Prepare for Action should be worn by members [illegible] nearest first aid kits

[illegible] that a[illegible] number of metal containers [illegible] tanks for distribution to gun stations

[illegible] all officers and [illegible] should receive instruction in first aid [illegible] being given somewhat more advanced teaching [illegible] hypodermic injections

7 A [illegible] of medical organization for action [illegible] subject to [illegible] the foregoing policy and principles should be prepared in all ships [illegible] including the allocation of spaces [illegible] and F A Ps and a statement of [illegible] fittings required—

(a) *Ships under construction or reconstruction* The scheme is to be prepared by ship's officers in consultation with a representative of M D G [illegible] as possible after the appointment of the ship's executive officer detailed proposals being submitted

(b) *Ships in commission* —[illegible] to be prepared by ship's officers existing facilities being developed and additional [illegible] demanded as necessary Work should as far as possible be carried out by ships staffs Where dockyard work is involved an item classified [illegible] should be inserted in the ship's list of alterations and additions but such work is to be kept to a minimum

## LIST OF PERMANENT FITTINGS

[illegible] Main *Distributing Station*

(1) Deck fittings and stowage for operating table
(2) Benches (fixed or hinged if insufficient room) for wounded
(3) Position for X ray plant
(4) Hot and cold water supply
(5) Hammock or stretcher billets in and adjacent to M D S
(6) Hinged table for instruments &c
(7) Cupboards or lockers for surgical dressings and comforts
(8) Curtain rail and curtains to screen cases under treatment
(9) Folding lavatory or wash basin baths
(10) Portable latrines
(11) Sanitary bins or buckets
(12) Overhead light fitting for operating table
(13) Lighting primary and secondary
(14) Sockets for X ray plant sterilizer and kettle
(15) Brackets with non-slip edges for sterilizers and kettles
(16) Telephones
(17) Ventilation

(ii) [illegible] *D*[illegible] *Station*—

(1) [illegible] station and in a mess fixed or hinged
(2) [illegible] water supply
(3) [illegible] stretcher [illegible] in and adjacent to the station
(4) [illegible] station and in a mess fixed or hinged
(5) [illegible] lockers for surgical dressings and comforts
(6) [illegible] lavatory
(7) [illegible] linen
(8) [illegible] basins
(9) [illegible] operating lighting
(10) [illegible] primary and secondary
(11) [illegible] for sterilizer and kettle
(12) [illegible]

(iii) [illegible]

(1) [illegible] (hinged)
(2) Hot [illegible] supply
(3) Stowage [illegible] other stretchers
(4) Cupboards [illegible] dressings, &c

## 850.—Prevention of Wound Infection and Cross-Infection

(M.D.G. [illegible] 1941.)

The War Wounds Committee of the Medical Research Council [illegible] spread of hospital infection [illegible]. As the result of the report [illegible] the following procedure [illegible]

1. When a wound is being dressed [illegible] worn by all [illegible] of the patient. These must [illegible] nose and mouth [illegible] preferably of gauze with [illegible] or stiff paper [illegible]. Masks should be sterilized [illegible]

2. Wounds [illegible] dressed [illegible] *provided all* [illegible] with sterile [illegible] supply of forceps [illegible]. Alternatively, sterile rubber gloves [illegible] be handled directly. [illegible] sterilized [illegible] gloves is necessary [illegible] there is some difficulty in supplying [illegible] gloves [illegible] reserved for special cases.

3. Soiled dressings should be placed [illegible] lined with [illegible] in such a way that the contents of the [illegible] and burnt [illegible] long. This should be done without delay.

4. The blankets on the bed of a patient suffering [illegible] wound [illegible] and must be sterilized before being used [illegible] patient.

Similarly the [illegible] theatre [illegible] in addition to frequent sterilization [illegible] with the patient [illegible] port should be avoided by the use of sheet [illegible] journey.

5. Wards and bedding are full of dust which [illegible]. No dressing [illegible] be done while the ward is being dusted [illegible] being made. All dusting and floor cleaning should be done with damp dusters [illegible] with mops impregnated with [illegible]

## 539.—Ratings Serving on Temporary Agreements—Dental Treatment and Gratuitous Supply of Dentures or Spectacles

(M.D.G. N. 1862/40.—6-2-1941.)

The following conditions are to govern extensive dental treatment and the gratuitous supply [illegible] of dentures or spectacles to ratings who have undertaken to serve on Temporary Agreements for the full period of the war (e.g. [illegible] and [illegible])

(a) That treatment has been sought [illegible] to prevent infection to other persons [illegible]

(b) That the supply [illegible] of dentures or spectacles [illegible] necessary to prevent invaliding or to render the man fit for the [illegible] period of [illegible]

(c) That the man's [illegible] desired [illegible]

2. Ratings serving on Temporary Agreements who have not undertaken to serve for the full period of hostilities are not eligible for dental treatment at the public expense.

## 1002.—R.A.F. Air-crew Casualties Admitted to Naval Hospitals—REPORTS

(M.D.G. [illegible]371/41.—6-3-1941.)

When members of air crews of the Royal Air Force are admitted as casualties to any Royal Naval hospital or sick quarters, each case on admission is to be specially notified

P

In the Unit[illegible] Air Ministry (M A P) [illegible] Kingsway [illegible]

2 The [illegible] number of air crew [illegible]

(a) [illegible] Branch Officer—pilot [illegible] gunner [illegible] flying duties

(b) [illegible] the grade of pilot [illegible] (wireless operator) wireless operator (air gunner) [illegible]

### 1097.—M 179—Medical Officer's Journal

(M D G 46636/40—6 3 1941)

Medical Officers are to omit the following references from the Journal during the period of hostilities

M 179A Time when and place where the patient taken ill

M 179C where the Hurts were received

2 The name of the Hospital, Hospital Ship, Sick Quarters [illegible] given [illegible] whether discharged [illegible] when the patient [illegible] sent [illegible] Sick [illegible] (M 179G and M 179H)

3 The Journal is to be treated as a confidential document and [illegible] marked and transmitted in conformity with King's Regulations and Admiralty Instructions Article 879 (b)

### 74—Transfer of R N Hospital Gt Yarmouth to R.N Auxiliary Hospital Lancaster

(M D G /C E 19770/40 —9 1 1941)

The R N Hospital Great Yarmouth has been transferred to Lancaster and is now accommodated in part of the County Mental Hospital Lancaster

2 All communications should be addressed in future to the Medical Officer in Charge R N Auxiliary Hospital Lancaster (Telephone No Lancaster 1106)

### 14—Inoculation Returns Rendered to Professor of Pathology—Revised Procedure

(M D G 48401/40 —21 P 41)

It has become more evident of late that Inoculation Returns rendered in accordance with King's Regulations and Admiralty Instructions Article 11[illegible] Clause 15 do not in many cases give the required information There is a wide difference of opinion among Medical Officers as to the degree or intensity of reactions following inoculations which should be regarded as sufficient to warrant their inclusion in such as the returns

2 For the returns to be of any value it is therefore necessary that there should be uniformity of procedure and in future they should be rendered on the form given below

INOCULATION RETURN

Ship or Establishment

Month ending

Type of Vaccine

| *First Inoculation* | Batch No and date | Nil | * | ** | *** | Total |
|---|---|---|---|---|---|---|
| Local Reactions | | | | | | |
| General Reactions | | | | | | |
| *Second Inoculation*<br>Local Reactions | | | | | | |
| General Reactions | | | | | | |
| Totals | | | | | | |

Special Reactions and Remarks —

[illegible]

## [illegible]—Reports on [illegible] Inquiry on Injuries—Information Concerning Issue of Hurt Certificates

(A.M. [illegible] 41 — 6 1941.)

When a Report [illegible] Inquiry [illegible] injury [illegible] is forwarded [illegible] Admiralty [illegible] Hurt Certificate [illegible] issued.

2. All doubtful [illegible] to the Admiralty [illegible] in accordance with Article [illegible] [illegible]

## 332—Discharge of Men Called up under the National Service (Armed Forces) Act

([illegible])

The attention of Commanding Officers [illegible] they are not authorised [illegible] National Service (Armed Forces) Act [illegible] Admiralty approval [illegible] first obtaining Admiralty approval.

When [illegible] immediately after [illegible] it has been decided that [illegible]

3. Where [illegible] they may retain [illegible] necessary [illegible]

4. Men [illegible] dealt with under [illegible] King's Regulations and Admiralty Instructions, Article 1679.

N.B. [illegible] Admiralty approval [illegible]

5. All men called up under the National Service (Armed Forces) Act [illegible] established [illegible]

([illegible])

## 333—Naval Ratings Invalided after having Lost their Kits through a Casualty of the Service—Compensation and Provision of Clothing

(N.L. A. [illegible] 40 — [illegible] 1941.)

Their Lordships have decided that [illegible] clothing [illegible] grant of money [illegible] made to Naval ratings [illegible] ratings who are discharged invalided [illegible] having lost their kit through a service casualty.

2. Claims for compensation for loss of kit must, however, be forwarded to the Admiralty in accordance with King's Regulations and Admiralty Instructions, Article 1602, Clause 2, paragraph (2) and [illegible] paragraph (6) [illegible] that the men are to be invalided.

3. To enable [illegible] themselves will [illegible] advances may [illegible] following limits:—

Naval ratings [illegible]

T.124 ratings [illegible]

Advances [illegible]

([illegible])

## 902.—R.N. Sick Quarters, Liverpool

(M.D.G. 6090/41.—27.[illegible].1941.)

[illegible] the R.N. Sick Quarters [illegible] Hospital, Old Hall Street, Liverpool [illegible]

([illegible])

## 941.—Travel to or from Ireland by Relatives of Naval Personnel who are Seriously Ill in Hospital

(N.L. [illegible] 1941.)

[illegible]

2. When [illegible] H.M. [illegible]

[illegible] Irish hospitals.

## 741.—Women's Royal Naval Service—Spectacles

(C.F. [illegible] 1941.)

With reference to paragraph 1 of A.F.O. [illegible] W.R.N.S. [illegible]

2. All serving W.R.N.S. ratings who wear spectacles [illegible] standard [illegible] type [illegible]

(A.F.O. [illegible])

## 538.—Sick Leave—Issue of Free Travelling Warrants

(C.W. [illegible]—[illegible] 1941.)

With reference to A.F.O.s 877/41 and 1197/40, free travelling warrants [illegible] January 2nd, 1941, be issued under the same general conditions to Naval [illegible] Officers of the rank of Lieutenant and below, and to ratings, W.R.N.S. officers [illegible] V.A.D.s of the equivalent rank of Lieutenant R.N. and below.

(A.F.Os. [illegible] 40 and 3197/40.)

*(This Order has been reprinted for posting on Notice Boards.)*

## 500.—T.124X.—Transferable Agreement—Invaliding

(N. [illegible]/41.—30.1.1941.)

With reference to A.F.O. 3096/40, Section 1, paragraph 1(e), it has been decided that the report of the final invaliding survey on Form [illegible] Medical History [illegible] shall be forwarded by the Officer Commanding H.M.S. Mersey to the Registrar General of Shipping and Seamen (Ministry of Shipping Liaison Officer).

(A.F.O. [illegible]/41.)

## 1107.—Medical Grading of Recruits by Civilian Medical Boards—REPORT

(M.D.G. 1898/41.—20.4.1941.)

Cases have occurred in which men passed as Grade I by the Civilian Medical Boards have been found soon after entry into the Navy to be below this Grade, and thus unfit for full Naval Service.

2. Where it is considered that [illegible] some error in the grading of a recruit by the Civilian Medical Boards has occurred, the case should be reported to the Medical Department of the Admiralty.

[illegible]

[illegible] the hospital.

### 1166.—Naval and Marine Personnel Dangerously Ill in Hospital—Visits [illegible]

(C.F. 1268/40—20.3.1941.)

The [illegible] of [illegible] railway [illegible] to relatives of [illegible] dangerously ill [illegible] hospital [illegible] A.F.O. [illegible] has been extended [illegible] relatives [illegible] (including officers) [illegible] of Queen Alexandra's [illegible] Naval Nursing Service, Queen Alexandra's [illegible] Naval Nursing Service [illegible] officers of the Women's Royal Naval Service.

(A.F.O. [illegible])

### 1044.—W.R.N.S.—Re-entry after Invaliding

(C.F. M.D.G. 6951/41—11.3.1941.)

[illegible] invalided from the W.R.N.S. [illegible] Admiralty approval. Any proposal for re-entry should be accompanied by [illegible] report.

### 1637.—Retention of Men Who Have Lost the Sight of One Eye

(N. [illegible] 1941.)

Men who have lost the sight of one eye [illegible] would normally be brought [illegible]

[illegible]

## BIRTH

VAUGHAN.—On March [illegible] 1941, at [illegible] Nursing Home, [illegible] Lieutenant and Mrs. [illegible] Vaughan [illegible] daughter.

## OBITUARY

We regret to report the following deaths [illegible] to the relatives.

SURGEON CAPTAIN FRANCIS [illegible], C.M.G., R.N. (Retd.) [illegible]

[illegible]

SURGEON CAPTAIN [illegible] R.N. (Retd.) [illegible]

[illegible]

SURGEON LIEUTENANT [illegible] R.N.V.R. [illegible]

[illegible] 1919 he was [illegible] in 1931.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

## HONOURS

*[illegible] of the Royal S[illegible]*

[illegible] the Royal Society [illegible]

*[illegible]*

[illegible] Lieutenant W. [illegible] (O.B.E.)

*[illegible] Despatches*

[illegible] Norwegian [illegible]

## RETIREMENTS

[illegible] M.R.C.S. [illegible]

[illegible] M.R.C.S. L.R.C.P. [illegible]

## PROMOTIONS

[illegible] M. McNamara, M.B. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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## WARDMASTERS

### PROMOTIONS

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

## ROYAL NAVAL VOLUNTEER RESERVE

### RETIREMENTS AND RESIGNATIONS

[illegible]

[illegible]

[illegible]

[illegible]

### PROMOTIONS

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Probation[illegible] [illegible] G. [illegible] [illegible]

[illegible] H. H. B. [illegible] April 2, 1938.

[illegible] A. Sm[illegible] 1930.

[illegible] M.B., [illegible] rank May [illegible] 1938.

[illegible] M.B. [illegible] April [illegible] 1941.

[illegible] M.B. [illegible] March [illegible]

[illegible] W[illegible] March [illegible] 1940.

[illegible] L. [illegible]

Probation[illegible] D. [illegible] May [illegible] 1940.

Probation[illegible] A. [illegible] May [illegible]

[illegible] A. [illegible] July [illegible] 1940.

[illegible] H. [illegible] March [illegible] 1941.

[illegible] H. [illegible] M.B., B.Ch., [illegible] rank [illegible] Surgeon Lieutenant [illegible]

[illegible] confirmed [illegible]

[illegible] R.N. [illegible]

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## QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

### RETIREMENTS AND RESIGNATIONS

Matron Miss I. Phillips, R.R.C., superannuated February 7, 1941 (re-employed in [illegible] Chatham Hospital [illegible] pending relief February 8, 1941).

Nursing Sister Miss P. E. Park resigns February 2, 1941.

Nursing Sister Miss V. [illegible] resigns April 1, 1941.

### PROMOTIONS

Superintending Sister Miss K. Baker to be Matron February 8, 1941.

Nursing Sister Miss K. M. Cooper to be Superintending Sister February 8, 1941.

### APPOINTMENTS

Matron Miss K. Baker to R.N. Hospital, Chatham.

Superintending Sister Miss O. H. Franklin, M.B.E., to R.N. Hospital, Hong Kong.

Acting Superintending Sister Miss F. M. Fowler, A.R.R.C., to R.N. Auxiliary Hospital, [illegible] Magna.

Nursing Sister Miss I. L. Skipton to R.N. Sick Quarters, Colombo.

Nursing Sister Miss I. A. Williams to R.N. Cadets' Sick Quarters, Dartmouth.

Nursing Sister Miss E. W. Ahern to R.N. Hospital, Haslar.

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## NAVAL MEDICAL COMPASSIONATE FUND

At the Quarterly Meeting of the Directors of the Fund held on February [illegible], 1941, [illegible] Vice-Admiral Sir Percival Nicholls, K.B.E., K.H.P., Medical Director-General of the Navy, in the Chair, the following cases were considered:

[illegible] of a Surgeon who died in 1926. No income other than [illegible] 14s. [illegible] Voted £50. Total amount paid to members of the family of this officer [illegible]

[illegible] of a Fleet Surgeon who died in 1881. [illegible] lost property as a result of enemy action. Voted £50. Total [illegible] of the family of this officer [illegible] £909.

## NAVAL MEDICAL COMPASSIONATE FUND

### Accounts of Receipts and Payments for the Year ended December 31 1940

| | £ s d | £ s d | | £ s d | £ s d |
|---|---|---|---|---|---|
| Balance at Bank on January 1 1940 | | | Awards to Orphans and Widows | | 661 0 0 |
| Current Account | 282 [illegible] 10 | | Secretary's Allowance | | 13 0 0 |
| Deposit Account | [illegible] | [illegible] | Auditor's Fee | | 1 1 0 |
| [illegible] Consolidated Stock | [illegible] | | Purchase of £300 3% War Loan | | [illegible] |
| [illegible] Stock | [illegible] | | Transfer of Stock [illegible] | | [illegible] |
| [illegible] Consolidated Stock | [illegible] | | Cheque Book | | 8 0 |
| [illegible] War Loan | [illegible] | [illegible] | Balance at Bank on December 31 1940 | | |
| [illegible] | | [illegible] | Current Account | [illegible] | |
| [illegible] | | [illegible] | Deposit Account | [illegible] | [illegible] |
| [illegible] Deposit Account | | [illegible] | | | |
| | | [illegible] | | | [illegible] |

[illegible]

[illegible] ... Stocks in the following ... [illegible]

[illegible] GRIFFITHS

Honorary Treasurer

## JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE

### Balance Sheet 1940

| Assets | £ s d | Liabilities | £ s d |
|---|---|---|---|
| Balance at Bank 31.12.39 | 162 6 2 | Nil | |
| £100 3% Funding Stock | 100 0 0 | Balance Creditor | 862 6 2 |
| £600 4% War Loan | 600 0 0 | | |
| | £862 6 2 | | £862 6 2 |

Approved at the Annual Meeting of the Management Committee held on January [illegible] 1941.

(Sgd.) L. Warren
Surg. Rear-Admiral

(Sgd.) H. [illegible] Hanna
Surgeon Captain R.N.
Treasurer and Joint Editor

# Notice

## 'TABLOID' OXYLAN

[illegible] for the treatment of oxyuriasis [illegible] has recently been added to [illegible] Burroughs Wellcome & Co. [illegible] worthy advantages [illegible] that [illegible] tablets of 20 and 100 [illegible] course of treatment.

Vol. XXVII          July 1941          No. 3

# Journal
of the
# Royal Naval Medical Service.

## Articles.

### REMEMBER THE HERNIAL RINGS!

By Surgeon Rear-Admiral GORDON GORDON-TAYLOR, O.B.E., M.A., M.S., F.R.C.S., F.R.A.C.S.(Hon.)

The instruction which constitutes the title of this brief note is not addressed to the more senior ranks of the Naval Medical Service. It is specially intended for such as have only recently passed some tribunal condescendingly conferring upon them for a sum of money the legal right to practise the art of medicine. Any lessons that may be learnt from this communication are, I know, far better expressed in the pages of the many excellent books on Surgical Diagnosis, such as that written by my old chief, Sir Alfred Pearce Gould. This book has run through many editions and was revised by his son, the late Surgeon Rear-Admiral Eric Pearce Gould, my own colleague, himself a teacher rivalling his father in brilliance.

This short paper, far from comprehensive, merely aims at reminding yet again the readers of this Journal, the sick berth staff, and even the younger members of the "most gentle profession" of a pitfall which has ensnared many a doctor in the past and will without doubt continue to defeat the clinician through his own carelessness so long as human nature remains unchanged.

The behest at the top of the page may prove of some slight value in the diagnosis of chronic abdominal pain, especially when this is felt in the nether region of the belly, but the slogan is likely to be of far greater service in the diagnosis of acute abdominal emergencies, for it is in this class of case that the mistake of omission is most frequently perpetrated. Neglect to take the infinitesimally small trouble required to place the fingers over the hernial orifices is inexcusable, and yet it has countless times led to failure to make an easy diagnosis before operation, and even if the carelessness may have fortunately not often led to fatality, there has too often resulted a median laparotomy incision of probably generous dimensions where a simple textbook operation in the hernial region would have sufficed. Although the strangulated hernia will be discovered in the course of the laborious manhandling of the contents of the abdomen by hands varying in gentleness of touch, the operator must indeed have a convenient conscience if he does not feel ashamed of his pre-operative omission to note an evident clinical sign. The presence of surrounding undergraduates has a most salutary effect upon the work in the wards and in the operating theatre and makes for care in pre-operative diagnosis, and obviously mistakes of omission to examine the hernial rings are far less likely to occur in a teaching hospital than in a less exacting surgical environment. I may be regarded as labouring unduly the mistake of an abdominal exploration where a mere herniotomy might have sufficed, for there are those who would deliberately elect to cure a hernia from inside the abdomen.[1] It is, however, well to remember that every scar in the middle line of the nether part of the abdomen, median or paramedian, renders the patient a potential candidate for future intestinal obstruction, and though his hernia may have been cured by the abdominal route he is little likely to win aught but a [illegible] championship whenever he endeavours to drive out his non-working [illegible] on home playing fields or upon the high seas.

Many commit this fault of diagnostic omission once, the important thing is not to be guilty of diagnostic negligence on a second occasion. In my early years, when I was Casualty Surgical Officer at Middlesex Hospital, my corresponding colleague on the medical side invited me to [illegible] an intestinal obstruction case which had come under his observation in the Casualty Medical Room. After I had examined and [illegible] some suggestions as to possible causes he duly asked me whether the swelling in the groin [illegible] could have had anything to do with the intestinal obstruction for which the woman had come for help.[2]

Soon after I had been elected an Assistant Surgeon to my own Hospital a Medical Superintendent of one of the London Infirmaries, long before [illegible] many of them have been glorified by names of the Saints, [illegible] a Fellow of the Royal College of Surgeons and engaged in a considerable amount of practice work, sent up to Middlesex a member of his nursing staff with a diagnosis of acute intestinal obstruction. He was anxious that the girl should have the benefit of the best that his old training school had to offer. Had he known that Sunday avocations of various sorts precluded any of his old teachers being available at Middlesex on that particular Sabbath Day, and that his protegee was destined to fall into the hands of a newly appointed surgeon, he might have elected to operate himself! Profiting however by my former [illegible] I did not omit to examine the hernial rings found a strangulated femoral hernia and dealt with it in the ordinary way I was secretly a little pleased when I answered his telephone inquiries as to the operative findings but I also tried to console him by recounting the former mistake of my own

A few years ago I was telephoned one evening by a most competent general practitioner now deceased telling me that he was sending up an elderly lady to see me next morning She had been sick her bowel was not acting satisfactorily and he thought she had a carcinoma of the colon he even informed me that rectal examination revealed no growth The woman was sent up by car with a nurse in attendance and during the drive of thirty miles up to town she vomited on one or two occasions The old lady entered my consulting room accompanied by the nurse ignored my outstretched hand of welcome brought up an enormous amount of stercoraceous vomit some of which she inhaled, and was dead in a second or two on the floor of my room My most vivid impressions of this case are firstly the strangulated femoral hernia of Richter's type which was found at the autopsy the amount of irreparable damage done to certain of the furnishings of my room and thirdly the complete apathy of the police in the matter when on being informed of the calamity by telephone they heard that the lady was seventy years of age!

I saw in Middlesex Hospital only the other day a man who had been subjected to an exploration of his uppermost abdomen on the inexcusable diagnosis of a perforated gastric ulcer Nothing was found amiss in this area and the laparotomy incision was gradually lengthened downwards until finally the hernial region was attained A strangulated hernia was then discovered After all this waste of time and unnecessary infliction of injury to the belly the constriction was dealt with and the bowel which was in a perilous state was left inside the [illegible] beside the internal abdominal ring A small intestine fistula formed and the man was admitted to Middlesex where the skill of my friend and colleague Mr Vaughan Hudson ultimately restored him to health His life had been gravely menaced and his recovery jeopardized by the neglect not only of his own medical attendant but [illegible] entrusted with his surgical care

The examining physician and also occasionally the surgeon would seem to be almost as reluctant to slip his fingers downwards off the belly to the groin as he is to make a rectal examination! Nor will the student be accounted guilty of bad manners if his fingers stray even farther down to the testicle he may acquire information of value through the [illegible] examination I recall the case of a soldier sent down from the trenches during the [illegible] a few miles back with a most distinguished and most careful surgeon who had diagnosed the [illegible] that of an appendix abscess. Failure to slip his fingers a few inches lower down had concealed from him the information that the patient had an undescended testicle on that side and had prompted the diagnosis of an ordinary abdominal condition, whereas, alas! a new growth of an abdominally retained testicle was the true pathological condition present.

Obviously a strangulated hernia, apart from such rarities as the obturator type, is only discernible by an examination of the hernial rings, but certain other information may also be forthcoming which may lead to the diagnosis of a hitherto obscure abdominal crisis. Perhaps a history may be elicited that a swelling has been present in the hernia region for some time, and that as a result of the previous doctor's examination, or of the patient's own vigorous intervention, the swelling may have been made to disappear, not with relief from pain, but with pain undiminished or even greatly increased. Fortunately the day of reduction of hernia *en masse* has almost completely passed.[1]

Another catastrophe of somewhat similar character may be produced by the vigorous, unorthodox manipulation of a strangulated hernia: a volvulus of the affected piece of bowel may be induced in this way. I have recollections of an old lady of the Jewish faith who was admitted under my care into Middlesex Hospital about a quarter of a century ago, who had on a previous occasion suffered from a strangulated hernia. Remembering the efforts made by her medical attendant, which had resulted in a successful reduction of the hernia by taxis, on the present occasion she had been unwilling to spend the necessary money on a medical man and elected to try to reduce this hernia herself. By strenuous efforts on her own part, which were supplemented by the loyal aid of her sister, the swelling in the right inguinal region was made to disappear, but this time extreme agony ensued. From then she put up with her pain and discomfort until late in the evening, before sending for her doctor, who, recognizing the serious condition of affairs, sent her straight away up to hospital. A volvulus of six [illegible] gangrenous bowel was found inside her abdomen; it was successfully [illegible] and the old lady fortunately made a good recovery.

A painful vas deferens, felt in the inguinal canal and upper part of [illegible] in a patient whose genito-urinary history had not been ascertained [illegible] from having a supposed acute appendix removed during [illegible]. An expectant line of treatment was adopted, and the development of an acute epididymitis the following day confirmed the cause of [illegible] in the right iliac fossa, and prevented a useless operation. The [illegible] the sudden development of a scrotal swelling in the [illegible] a hydrocele, may prove to be the key to the diagnosis in a case [illegible] hitherto failed to suggest a serious condition. Exploration of the hydrocele may reveal the presence of malignant nodules and the diagnosis of an inoperable abdominal neoplasm formulated.

In regard to the diagnosis of chronic pain, it is well to remember in the right-sided and left-sided pain low down in the abdomen the possibility of an incipient hernia being responsible. Some of the cases which are labelled 'chronic appendicitis'—always a doubtful diagnosis in the middle-aged and elderly—are found after an unsuccessful removal of the appendix to be really patients with a hernia in the process of genesis!

Remember the hernial rings!

Omission to make this examination is indefensible and savours of the grossest carelessness.

## GUN-SHOT WOUND OF THE ABDOMEN

By Surgeon Commander T. N. D'ARCY, R.N.

Much has been written concerning abdominal wounds in times of war and peace and all surgeons owe a debt of gratitude to Mr. Gordon Gordon-Taylor for his masterly booklet on the subject of war wounds, compiled as a result of his experiences in the years 1914-18.

New weapons and more frightful means of destruction have made their appearance since then; however, the general technique of operative treatment, and the rules which should guide us in our judgment of procedure, remain as reliable today as they were found to be in the tragic days of the last great holocaust.

While details of operative technique were more or less stabilized, much conjecture existed immediately before the outbreak of the present hostilities concerning the improved prognosis to be expected from the employment of such modern adjuvants as transfusions, infusions, sulphonamide medication, &c. Facile est inventis addere.

Much research work has been done in recent years on the causation and treatment of wound shock, and a point had been reached when we almost began to hope that this great killer had been vanquished. While no one doubts that advances in treatment have been made, there still remains that incalculable human element which defeats all scientific effort in this direction. A patient is seen, most gravely wounded, who exhibits but little evidence of shock and for whom little has been done apart from rest, morphia, and giving warmth; while on the other hand we are sometimes confronted with the man who fails to respond more than temporarily to the most energetic anti-shock measures at our command. There must be something in the mental make-up of these people which is still altogether outside up to [illegible] our anxiety [illegible] abdominal [illegible] and numer[illegible] have been made and when [illegible] [illegible] very often hard to interpret.

Turning now to the subject of chemotherapy [illegible] the number [illegible] reports, claims, counter claims and refuta[illegible] literature during the last couple of years [illegible] only exceeded possibly by a similar outbreak of [illegible] different conditions [illegible] which are wholly unaccept[illegible] really exists? Which is the best [illegible] different forms of contamination are [illegible] when used locally—a well [illegible] Does it make any difference whether [illegible] during a course of sulphonamide? Which of the group of drugs is most likely to cause agranulocytosis? Wh[illegible] the accompanying nausea and vomiting? [illegible] questions which are discussed [illegible] The various manufacturers [illegible] their advice naturally [illegible] from many different sources and [illegible]

One [illegible] especially when [illegible] considerable group of cases [illegible] and [illegible] sulphonamides [illegible] trial for the cure of [illegible] chemotherapy is still in this [illegible] One's personal [illegible] to use them many [illegible]—it seems to be less toxic [illegible] Its great advantage is [illegible] when [illegible] impossible. In spite of asser[illegible] that these drugs have a very definite beneficial [illegible] sepsis but they [illegible] The flavine [illegible] It is not by any means [illegible] they do not delay heal[illegible] The sulphur bogy would seem to be much [illegible] As to which of the compounds is [illegible] no opinion can be given as [illegible] have encountered it yet. Concerning the [illegible] and vomiting we are continued that apart from giving an abundance of fluids and a certain amount of alkali the best single remedy is nicotinic acid—it can be given up to 500 mgm. daily but a 50 mgm. tablet given with each dose of sulphonamide usually suffices. Vitamin C in the form of ascorbic acid tablets of 50 mgm. is usually given in doses up to 150 mgm. daily and this can be administered intravenously.

Most of the subjects discussed have a very intimate bearing on the case which is now about to be described. Other points arise and will be alluded to where met with.

Apart from the immediate lethal effect of abdominal injuries it is well recognized that early operation is imperative and that every hour of delay after about six is another nail in the coffin. The site of injury is an important consideration and we know that the large gut withstands injury much more poorly than does the small intestine; this is partly due to inadequate peritoneal covering in certain situations and to the fact that the contents of the colon are septic. Abadie has furnished us with an interesting diagram dividing the abdomen into zones and showing the mortality associated with penetrating wounds of different areas. Wounds of the jejunum are said to be less serious than those of the ileum, as with its wider lumen it lends itself to suturing and so avoids the much more dangerous procedure of resection. The state of absorptive activity of the small gut does not seem to affect the prognosis but the presence of much fluid content within the lumen at the time of injury must have a deleterious action. Wounds of the sigmoid colon and caecum are generally considered to be less dangerous than those sustained by other portions of the large intestine.

A burn of the intestine is not a condition which one sees mentioned in the literature, as tracer bullets are a comparatively new invention. It appears to be a real entity and it presents a new problem in treatment. How are we to know if the portion of scorched gut is viable, and what are we to do with it if we satisfy ourselves that it will survive? This problem presented itself in the following case.

Mr. S[illegible] aged [illegible] tracer bullet from [illegible] March 1 1941. He was sitting [illegible] penetrated the abdomen [illegible] to the left of the [illegible] from only slight shock [illegible] action was [illegible]. Before entering the belly the bullet passed through the upper and outer aspect of the left thigh for a distance of six [illegible] passed [illegible] blood-stained [illegible]

[illegible] his coming to the theatre. There was no [illegible] during the [illegible] nothing had been given by the mouth. It may be noted in passing that [illegible] boiled water in cases of suspected bowel injury are not [illegible] harmful action, and they afford much relief from the [illegible] thirst experienced by these patients.

When [illegible] hospital at 1700 on March 2 his general condition was [illegible] terrible thirst and abdominal pain and the abdomen [illegible] very tender all over. There was a small [illegible] in the area already indicated and from this there [illegible]. His odour was not at first apparent but later [illegible]. A thin purulent discharge came from the wound [illegible] relative position [illegible] there I found that the bullet [illegible] horizontally backwards and slightly to the right [illegible] this was so and I was in no doubt that [illegible] intestines in component parts—bullet and [illegible] lying below and above the 5th lumbar [illegible] the midline and the [illegible]. Numerous small fragments of [illegible].

[illegible] which proper [illegible] was given [illegible] 200,000 [illegible] per cent [illegible].

[illegible]

[illegible]. The [illegible] in the [illegible] cavity [illegible]

During [illegible] the examination alluded [illegible] bullet casing was found lying [illegible] the perforation [illegible] and was removed. A large rent was felt in the posterior [illegible] overlying the sacral promontory, and inside this lying [illegible] the bifurcation of the abdominal aorta the bullet itself was [illegible].

Having completed the examination and repair [illegible] during which it was found necessary to make a transverse [illegible] original abdominal section to the right, the large gut was [illegible] the caecum and it was with dismay that further damage [illegible] pelvic colon. A small perforation of the anterior wall [illegible] couple of sutures and then 2 in. below this was seen a whitish [illegible] 2 in. long by 1 in. wide occupying the anterior [illegible] wall of the bowel. There was no damage discernible to the mesentery or peritoneum in this region. The white patch had a tough rubbery feel and looked and felt as if a rectangular piece of thin sheet rubber had been inserted into the wall of the gut—there seemed to be a little charring at the edges but no actual solution of continuity of the bowel wall. The presumption was that this condition was due to a scorch or burn caused by the hot tracer part of the missile which had previously been removed from a perforation in a coil of small intestine lying in close proximity to this part of the pelvis. It was impossible to form an opinion about the viability of this insert or to what extent the pathological process extended outwards in the bowel wall. As far as one could feel the whole thickness of the wall was involved. It was impossible to exteriorize the portion of affected gut by reason of its position and any extensive procedure would have been out of the question at any rate owing to the length of time required. One felt that the position already pretty hopeless was now beyond recovery and that nothing further could be done except to close the abdomen. It was at this stage that an illustration in an article by Professor Grey Turner came to mind and saved the situation. Exact details of the technique could not be remembered at the time but a search of some old cuttings at a later date discovered the article in question: the article appeared in the *British Medical Journal* of April 27, 1940, and the illustration (fig. 4) depicts the repair of two adjacent perforations of the small gut. From our experience of the present case it seems that it is of equal value in dealing with similar lesions of the large gut. The procedure consists of folding the coil of injured intestine on itself in its long axis and placing a row of seromuscular sutures around the edges of the fold thus sealing off the injured area. A kink is produced and, as Professor Grey Turner says, one has to risk the possibility of obstruction. No obstructive symptoms referable to this manoeuvre appear to have occurred in the case under discussion. One does not know whether, in this case, sloughing of the damaged area took place with the formation of a [illegible] whether the part recovered and just a kink [illegible] replacing the line of sutures already mentioned the [illegible] epiploicae were brought together and sewn across the [illegible]

[illegible] for the presence of a possible retroperitoneal haema-[illegible] the abdomen was closed in layers and tension sutures [illegible] anti-gas gangrene serum were placed in the peri-[illegible] and a further 4,000 units given into the muscles [illegible] A large rubber drain was led down to the area of retro-[illegible] of the serum and the wound was well swabbed [illegible] before 15 grm. of sulphonamide powder [illegible] The abdominal incision had been [illegible] during the course of the operation. A rubber [illegible] laid between the muscle layers. No separate drainage [illegible] peritoneal space, although this had been laid [illegible] the bullet had lodged.

The operation lasted [illegible] five minutes, the pulse-rate was 140 at the [illegible] condition was remarkably good.

[illegible] temperature was 99·4°, pulse-rate 70 and respira-[illegible]

[illegible] pint of stored blood was given by slow drip [illegible] the operation. He had morphia gr. ¼ during the [illegible] drip (30 to 40 drops a minute) [illegible] and he was given chewing gum for the [illegible] He was nursed in Fowler's posi-[illegible] every hour. Sulphathiazole M. [illegible] hourly in one gramme [illegible] in 20 c.c. glass ampoules [illegible] drip apparatus by means [illegible] during the day and morphia [illegible] very slight cough he had no respiratory [illegible] run into a vein during this [illegible] of sulphathiazole were given during [illegible] notes will now be given from [illegible]

Mar [illegible] pulse 80. Fairly comfortable night. Passing [illegible] than the day before. No flatus passed. Dressing [illegible]—wound looks clean. Thirsty. Blood-count [illegible] 4,000,000, white cells 11,8[illegible] (polymorphs 80%), Hb 92 per cent [illegible] Fluids [illegible] since [illegible] by mouth M & B 693 [illegible] by mouth. [illegible] 2 hours [illegible] Ascorbic acid 300 [illegible]. [illegible] gr. at night.

March 5. At 0400 suddenly awoke complaining of pain and vomited 5 oz. of bilious fluid. Awakened again at 0615 and vomited. Vomiting relieved his pain. [illegible] pulse rate [illegible]. Fluids then restricted to hourly drachm doses by mouth. Intravenous fluids continuing. At 0900 the temperature was slightly subnormal and pulse rate 80. Thought he passed a little flatus. Does not look at all well. Skin of abdomen strained. Abdomen distended and rigid. Thirsty and tongue very dry. Fluid intake 98 oz.—output 86 oz. Two litres of dextrose in water given intravenously during the day. At 1800 the temperature had risen to 99 F. and the pulse rate was 108. Vomited repeatedly during afternoon—foul fecal smelling vomit. Flushed and looks ill. Dressings through and blood stained. Abdomen very distended and tender. Needle [illegible] of vein in leg and surrounding tissue reddened and painful. Said to have passed some flatus. Stomach washed out with much relief. Needle reinserted in vein on hand. [illegible]. Everything by mouth stopped and continuous duodenal drainage begun. Sulphathiazole again ordered in 4-hourly [illegible] doses. Oxygen by mask for ten minutes every hour. Heat to abdomen. Much foul matter was sucked away through the duodenal tube. Silent abdomen. Drain removed.

March 6. Temperature 98.8 F., pulse 76. General condition improved and he looks and feels better. Duodenal tube working well. Intravenous drip satisfactory. Abdomen less distended. Discharge from abdominal drainage tube is less. Drain removed from angle of wound on right side where signs of sepsis are present. Alternate litres of Hartmann's solution, dextrose saline and dextrose in water [illegible]. White cells [illegible]. Fluid intake 125 oz.—output [illegible] oz. [illegible] during the night. Sulphathiazole repeated four hourly.

March 7. Temperature 99 F., pulse 104. Condition deteriorating. Beginning to pass [illegible]. [illegible] spasm of [illegible] and [illegible]. Abdomen very rigid and a little more distended [illegible]. Tongue moist and [illegible]. [illegible] well. Discharge from [illegible] much less. [illegible] less. Vomited [illegible] difficulty in [illegible]. Intravenous drip [illegible] running away from the [illegible]. Abdomen [illegible]. Oxygen inhalations continued. [illegible] intake and output charts [illegible] tube passing directly down [illegible] feeling and [illegible] duodenal tube. [illegible] Sulphathiazole continued.

[illegible] 98.8 F pulse 120 Looks much worse and is [illegible] in no pain Little discharge from abdominal [illegible] healthy some pus from outer corner at site of [illegible] had some sleep No peristalsis heard Enema [illegible] some flatus and a little faeces came away Di[illegible] Intravenous drip continuous suction ox[illegible] Sulphathiazole continued in four hourly in je[illegible] Carbachol 0·25 mgm ordered six hourly

M[illegible] pulse 102 Condition unchanged P R [illegible] except ballooning of rectum Practically no [illegible] Abdominal wall only very slightly septic Slept [illegible] tense and distended but not so tender Duodenal [illegible] and discomfort in throat Abdomen still silent [illegible] in mouth Some sutures removed Duodenal [illegible] held in readiness Calomel gr 1 hourly till [illegible] Red cells 4 680 000 white cells 16 800 [illegible] One pint of fresh citrated blood given intra[illegible] Two drachms of fluid by mouth [illegible] Stock of liquid sulphathiazole exhausted [illegible] given with no result At 1800 [illegible] and developed hiccough Restless [illegible] Complains of sore throat due to indwelling [illegible] Abdomen tense and [illegible] Ryle's tube was again passed and suction [illegible] doses by mouth to relieve soreness [illegible] Heroin ordered but not found necessary [illegible]

[illegible] pulse 110 Bowels opened freely during [illegible] times with saline and faeces Rectal [illegible] fluid was not being retained Is very [illegible] had absorption during last twenty four hours [illegible] intravenous therapy and to the free passage of [illegible] much less distended Peristalsis heard for [illegible] day Discharge from duodenal catheter [illegible] less sore General condition unchanged [illegible] almost gone No cough Condition of [illegible] wound is opening out and is rather more [illegible] of burst abdomen Stock of [illegible] pituitrin added to saccharine Glucose [illegible] intravenously Suction drainage con[illegible] &c Elastoplast corset applied to [illegible] sore throat Carbachol continued

1800 Temperature [illegible] F pulse 152 Bowels open three times during the afternoon and slight vomit once General condition deteriorated during the day M & B 693 (soluble) ordered six hourly in one gramme doses to be given intravenously Carbachol was discontinued The first dose of M & B though given very slowly caused immediate pain up the arm and subsequent thrombosis of the cephalic vein after this it was given intramuscularly Heroin was given again this night

March 11 Temperature normal pulse 110 Had a good night's sleep and passed the first formed stool in the morning Faint peristalsis heard all over abdomen Looks very thin and emaciated and is very weak Abdomen less distended Seems to have improved since M & B started but leucocyte count is falling—8 700 No dark matter being drawn up suction tube Abdominal wall less septic Discontinue suction drainage. One drachm of fluids hourly by mouth One more dose of M & B to-day 1800 Definite improvement in his general condition noted for the first time Temperature 99° F pulse 108 No vomiting after taking fluids by mouth all day Bowels well open again watery with some hard faeces One and a half ounces of fluid by mouth hourly Another gramme of M & B 693 given intramuscularly at 2100

March 12 Temperature normal pulse 80 Making rapid improvement Looks much better and feels stronger No further vomiting Abdominal distension disappearing Fluid intake 127 oz —output 78 oz Increase fluid to 2 oz hourly Stop intravenous drip when present [illegible] is empty Stop oxygen and fomentations to abdomen Commence ascorbic acid by mouth 300 mgm daily M & B 693 one gramme daily by intramuscular route Complete blood examination Blood urea Plasma chlorides Blood count as follows Red cells 4 930 000 white cells 11 250 Hb 84 per cent C I 0·85 Blood urea 30 mgm Plasma chlorides 500 mgm per cent

March 13 Temperature 98·8° F pulse 86 Had a fairly good night Taking his feeds of water well Bowels open many times (about 12) during past twenty four hours Fluid stools No nausea Distension of abdomen disappearing and wounds cleaner and healing Remove remaining sutures and drain Stop M & B Commence cod liver oil and malt Three ounce feeds two hourly (Benger's albumin water Horlick's) and water in between feeds in moderation

All during this day his troublesome diarrhoea continued and he had but little control over it Sleeps a lot but bowels open before he can become properly awake Diarrhoea is painless and there is no tenesmus Mist bismuth salicylate was given to check the diarrhoea Massage and friction to limbs

March 14 Temperature 99·2° F pulse 100 Good night and has some control over diarrhoea Abdomen flaccid Skin separated widely at site of guished [illegible] and there is now an area of sloughing muscle exposed about three inches in diameter. Wound not seriously septic. Some pain [illegible] through [illegible] in left upper limb. Increase amount of feeds to 4 oz. two hourly. Down from Fowler's position.

March 15. Diarrhœa [illegible] off but still troublesome. Sleeping well. Not [illegible] appetite. Throat a little sore—fauces inflamed.

March 16. Diarrhœa continues but is less and he now has control.

March 17. Bowels still loose and very offensive. Throat very sore—fauces [illegible] but no ulceration seen. Abdominal wounds show more signs of [illegible] and breaking down but there is very little pus. Muscles of body [illegible]. [illegible] paste. Kaolin [illegible]. Reduce amount of [illegible] acid.

March 18. Removed from D.C.I. Diarrhœa almost ceased. In view of [illegible] temperature a blood-count was done to exclude [illegible] white cells 10,875.

March [illegible]. Temperature [illegible], pulse 84. Sleeping well and now has a good appetite. Abdominal wound cleaning up. Passing formed stools.

March 2[illegible]. [illegible] Was a little sick and had a temperature [illegible] last night. Feels all right today. Very vigorous [illegible] Malaria [illegible] high [illegible] no sign [illegible] W[illegible] 11,0[illegible]

March [illegible]. Temperature [illegible] last night but normal today. [illegible] Abdomen slack. Wound still open. No [illegible]. Sodium [illegible] 10 [illegible] gr. [illegible] intramuscularly [illegible] wound.

March [illegible]. [illegible] Temperature not settled down. Did not sleep well. [illegible] suspected but suspicions not [illegible]—N.A.D.

March [illegible]. [illegible] Eating and sleeping well.

March [illegible]. [illegible] abdominal pain last night but this has gone now [illegible] muscles. Wound [illegible] Abdominal exercises &c. Marm[illegible]

April 2[illegible]. [illegible] Wound beginning to heal over. Sleeping and [illegible] well. [illegible] to granulations.

April 6. Wound [illegible] No complaints. Up one hour.

From [illegible] rapid progress and was discharged to [illegible] on April [illegible] it was learnt that he had been awarded the Conspicuous Gallantry Medal, and this everyone agreed was a fitting climax to the [illegible] outside and inside the hospital.

[illegible]

[illegible]

During the [illegible] he was given [illegible]

| | |
|---|---|
| Dextrose [illegible] | 9 litres |
| Dextrose [illegible] | 8 litres |
| H[illegible] | 3 litres |
| Normal saline | 1 litre |

[illegible] that the [illegible] of 20 litres represents [illegible] supply. No trouble was experienced with [illegible] or [illegible] except in the one instance when throm[illegible] followed the [illegible] of soluble M & B 693 into the delivery tubing.

Spread over a period of [illegible] days he received

| | |
|---|---|
| Prontosil [illegible] | 10 c.c. |
| Sulphanilamide [illegible] | 15 grm. |
| Sulpha[illegible] | 20 grm. |
| M & B 693 [illegible] | 6 grm. |
| M & B [illegible] | [illegible] grm. |

During the course of treatment he received Carbachol 2.75 mgm. in eleven subcutaneous injections.

The indwelling duodenal tube was maintained for nine days with one short interval of a few hours. A Ryle's tube was used and at no time did it cause any discomfort in the nostril through which it was passed. It did, however, give rise to much soreness in the throat and more frequent changing to a clean smooth tube is advisable. Small amounts of glycerine swallowed seemed to help considerably. Any form of liquid can be safely taken by mouth while the suction is working. It is considered that the use of this procedure does not obviate the necessity for performing an enterostomy proximal to an obstruction of the small intestine.

## SUMMARY

Gunshot wounds of the intestines have been discussed, and some modern improvements in the post-operative management indicated.

Special attention is drawn to the life-saving method of intestinal drainage in cases of ileus first described by Wangensteen in 1933 for the treatment of intestinal obstruction.

A patient has been kept supplied successfully for ten days with the necessary fluid, salts and nutriment by means of continuous intravenous drip (30 to 40 drops a minute). A small bore needle was used throughout and gave rise to no trouble necessitating the use of a cannula.

Soluble sulphathiazole has been introduced intravenously with good results and no local or general toxic effects noticed.

Local sulphonamide does not prevent sepsis in a wound, but appears to retard its onset and to lessen its intensity.

A case is described in detail showing multiple perforations of the small [illegible] the retro-peritoneal [illegible] Ri[illegible] of almost [illegible].

Fig. 1 [illegible] shows the [illegible].

My thanks are due to Surgeon Lieutenant [illegible] R.N.V.R., who gave an excellent anaesthetic, [illegible] is responsible for the photographs, and to Surgeon Lieutenant [illegible] R.N.V.R., who gave me much assistance at the operation.

I am indebted to Surgeon Captain [illegible] for permission to publish the case.

* * *

## THE MEDICINE OF FLYING

By Surgeon Commander J. D. SIMPSON, M.D., M.R.C.P., R.N.V.R.

The association of the doctor with flying is very old [illegible]. Leonardo da Vinci, the artist famous as an anatomist, made model helicopters [illegible] of his more orthodox designs are very similar to those in use today.

It was a physician, however, John Jeffries of Boston, who was the first to fly across the channel. In 1785 he flew with Jean Pierre Blanchard from Dover to Calais in a hydrogen-filled balloon. He is [illegible] in aviation than in medicine, so the credit for being the first [illegible] the problems of aviation cannot be given to him.

In 1862 Glaisher and Coxwell ascended to approximately [illegible]. During this flight Glaisher noticed curious changes in his vision and hearing, and a paralysis of the arms and legs. Finally he became unconscious, and was only saved by Coxwell, who had the presence of mind to seize the valve rope with his teeth, in spite of the paralysis of his arms, and start the balloon's descent.

Their reports attracted the attention of the French physiologist, Paul Bert, who began to study the effects of the changes of barometric pressure on the human body.

In 1875, under his supervision, Tissandier, Crocé and Sivel made [illegible] in a balloon. An adventure which unfortunately ended [illegible] of them. Their notes give a remarkable description of the symptoms with which we are all familiar today.

In Tissandier's own words:

> I now come to the fateful [illegible] the terrible action of reduced pressure. At [illegible]

> [illegible]

[illegible]

[illegible] It was not [illegible] for airmen [illegible] 50 per cent [illegible] their training [illegible] defects [illegible] medical examination.

[illegible] pilots had been [illegible]

In [illegible] where [illegible] lasting four months.

1918-19[illegible] was a period [illegible] in the realm of aviation medicine and [illegible] papers were written. During 1920-1933, however, little more was [illegible] research [illegible] until the improvements in aircraft [illegible] and the interest [illegible] aviation stimulated scientific research that work began again.

The problem which presents itself [illegible] to those interested in aviation medicine [illegible] and maintain the health of men who are going to work in [illegible] completely different from that with which we are familiar. In [illegible] have to carry out [illegible] and well co-ordinated movements [illegible] low temperature and in an atmosphere where the oxygen tension [illegible]. At the same time they may be subjected to various centrifugal forces [illegible] which those living on terra firma are completely unfamiliar. These problems are the same for peace and war. The fighting airman has superimposed upon him the necessity of maintaining himself both physically and mentally in good health in spite of long periods of inactivity, often in outlandish and isolated places.

## [illegible]

[illegible] pilot [illegible] They are interviewed by [illegible] then referred for medical examination [illegible]

(1) A careful [illegible] is paid [illegible] manifested by insomnia [illegible] or any [illegible] A severe head injury or [illegible] is fully [illegible] fits are an absolute bar

Of the diseases of the chest [illegible] exclude. Fainting attacks or giddiness [illegible] under strain, are carefully noted

Of the special senses inquiry is made into the history [illegible] and any tendency to conjunctivitis [illegible] type is likely to relapse under the [illegible] goggles

A history of discharge from the ear [illegible] makes a particularly careful examination necessary [illegible] of the upper respiratory passages is likely [illegible] long periods of flying

A history of sea, car, or train sickness [illegible] particular discomfort on swings or roundabouts may indicate labyrinthine instability and makes special examination desirable. Details as to education and occupation, particularly as to whether there have been numerous changes (athletics, hobbies) are always carefully investigated, for it is on these that the psychological background of the candidate must be based

Further data as to temperament may be obtained from an investigation of his habits in the use of alcohol or tobacco

Details as to the type of drink, and whether a pipe or cigarettes are favoured, are found to be of considerable value. Further evidence of the mental make up may be gathered from investigation of the nervous ailments that have occurred in the family

(2) Following this interview a general medical examination is conducted. The examiner makes a note at the end of this of his general impression of the mentality and physique of the candidate. The size of the thyroid gland is noted

Particulars are then taken of the height, weight and chest measurements and it is noted whether these fall within the limits of the average

A simple exercise tolerance test is carried out in which the pulse rates at rest, after standing, and after exercise are observed. A general examination of the heart, lungs and nervous system is made. The systolic and diastolic blood pressure is investigated and any abnormality counts against the candidate. Tremors of the fingers and eyelids are looked for. Balancing tests are [illegible] the cumulative loss is stated [illegible] Finally the 40 mm. mercury [illegible] below [illegible] the mercury has to be held [illegible] for as long as possible.

[illegible] then carries out a careful eye examination par[illegible] paid to the ease of pilots to muscle balance and [illegible]

[illegible] An examination of the ear, nose and throat is made, special note being [illegible] the upper respiratory infection or blocking of [illegible]. Details of the examination and methods of conducting [illegible] are all laid down extremely well in A.P. 130 published by His Majesty's Stationery Office.

[illegible] results of all the examinations are assessed by the President of the Board [illegible] repeats any test which has been below the standard required. The object of the assessment is to select men who are capable of withstanding the stresses entailed by prolonged periods of flying in peace or war. The findings of one particular part of the examination will often be corroborated by those of the other parts. For example, a man who gives a family history of nervous instability and has lived in an atmosphere fraught with anxiety and hypochondria, and who smokes cigarettes rather than a pipe and drinks cocktails instead of beer (not necessarily in excess), will be found to have a rapid rise in pulse rate when rising from sitting to standing. His systolic blood pressure may be rather high. A soft systolic murmur will possibly be heard. The deep reflexes may be exaggerated. The 40 mm. test will show an early and rapid rise of pulse rate, however in spite of this he may be able to maintain the mercury at the required pressure for seventy or more seconds. Though a man of this type would not fail any of the tests he is unlikely to make a good airman. Closer investigation of his life history may reveal that he has changed his job and is incapable of settling to any post [illegible] for long.

The [illegible] like individual, on the other hand, whose reactions are [illegible] and whose pulse varies but little, who has never wandered more than [illegible] miles from his own home and is perfectly content to follow some dull [illegible], is equally unlikely to make a first class pilot or observer.

Slight malformations of the nose, which are of no importance to ordinary people, matter very considerably to those who fly. A slight septal deviation [illegible] incomplete drainage of the sinuses, leading to low grade infection. This [illegible] produces congestion of the whole of the mucosa, with [illegible] of the lymphatic tissue around the pharyngeal opening of the Eustachian tube.

The function of the Eustachian tubes is the drainage of the middle ear [illegible] for the equ[illegible] [illegible] the human th[illegible] [illegible]

The mechanism [illegible] pharyngeal end [illegible] During an ascent [illegible] some 4 mm. of mercury [illegible] of air from the [illegible] clicks are not [illegible] difference in pressure [illegible] opens. In this direction the [illegible] However, during a descent [illegible] the Eustachian tube the opening [illegible] must [illegible] Man does not open his Eustachian [illegible] only [illegible] mouth or clenches his fist, but the [illegible] opens each time he [illegible] or shouts. If by any chance he does not equalize the [illegible] from 3,000 ft., a difference of pressure of 90 mm. [illegible] voluntary effort will not be strong enough to relieve [illegible] damage may be done to the drum. This diminution of [illegible] middle ear is characterized by discomfort in the ears. Before [illegible] experienced the hearing diminishes in acuity and it is noticed that [illegible] becomes very quiet and then, if the nose is held and the ears [illegible] saliva is swallowed, the normal sound of the engine returns.

From these examples it will be seen that this initial [illegible] of the man is of paramount importance. Much very good work [illegible] in the past, but the shortcomings [illegible] of the Selection and Medical Board may be appreciated from the fact that a large number of men fail to pass their elementary flying course. Candidates for flying are selected from (*a*) those already in the Service and (*b*) as direct entries. As far as has been ascertained up to date the failures in the Elementary Flying Schools are smaller in the first group than in the second. This is probably [illegible] (*a*) the Commanding Officers have had six to nine months in which to form an opinion of the men's temperament and character, while in (*b*) the Selection Board have to make the same assessment at one interview. In the future it is possible that various psychological tests will be introduced and by these means the number of throw-outs during elementary flying training will be much reduced.

The Station Medical Officer is responsible for the hygiene and general health of the men under his care, but over and above this he has to deal with the special problems of flying. If he makes a point of collaborating with the flying instructors and Squadron Commanders he may be able to correlate faults in flying with physical defects. The outstanding work of this type was done by Wing Commander Clements, who found that pilots who had difficulty in judging their height from the ground when landing, in many [illegible] degree of eso- or exophoria. It is [illegible] the optimum moment for [illegible] of Eustachian catarrh has [illegible] been [illegible] enlightening to apply the tests for physical efficiency [illegible] described in the admission examination to those who are recovering from an attack of influenza. The effort tolerance test falls off and, although a man may feel perfectly fit, his 40 mm. mercury tolerance test will not have returned to his normal for quite an appreciable time.

Those who have suffered from a blow on the head, however slight, must be examined extremely carefully before they are allowed to return to flying duties. The following tests have been found of value in assessing these conditions.

(1) In the ophthalmic examination as described in A.P. 130 it is found after head injury that the power of accommodation and subjective and objective convergence will be appreciably reduced.

(2) By the Maddox Rod Test eso- or exophoria may also be detected in a greater degree than before the accident.

(3) The head shaking test. When the patient no longer has any headache he is made to stand with his heels together and hang his head down as far as he can. He is then told to shake his head ten times vigorously and stand up, keeping his eyes shut all the time. A normal man can just do this, but those suffering from a recent blow on the head find it extremely difficult to remain steady.

Similar changes to those after a head injury occur after alcoholic excess and these objective signs prove a useful method of investigating those whom it is thought have been indulging too freely. To ground a pilot for a day or two has a most salutary effect.

An appreciable time should elapse before a man is allowed to return to high flying after he has recovered from any illness or injury which has resulted in a considerable loss of blood. Recovery should be checked by blood-counts. The danger of letting men fly when the oxygen carrying capacity of their blood has been reduced is not always realized, and even after a slight epistaxis the pilot should be stood off operational flying for two or three days.

The psychological well-being of the flying personnel is the particular care of the Station Medical Officer. It is essential that he should be able to recognize a psychosis or anxiety state in its very early stages, as it has been shown that it is only when treatment is started before the condition has fully developed that return to full flying duty is at all probable. The differential diagnosis between a depressed melancholic, an anxiety neurotic, and a man who has lost his nerve and wishes to escape a job which he finds far more [illegible] extremes [illegible]. It necessitates a close study [illegible] and [illegible] every opportunity to get [illegible] the Ward [illegible] and by flying with them. [illegible] who have taken to the air [illegible] keep apart. By flying himself [illegible] by any other method. In this respect [illegible] are invaluable. Again, the airmen [illegible] has made a special study of his particular problem [illegible] to go to him, just as a woman is happy [illegible] although no 'ologist' has as yet been assigned [illegible].

Apart from these benefits it is of great importance [illegible] should understand the symptoms and signs of anoxaemia [illegible]. Although symptoms of oxygen lack represent the first of the [illegible] on the subject, it is surprising what few clear ideas those [illegible] them.

### HIGH FLYING

Lectures on the lines of the following notes [illegible] given by the R.A.F. have proved of value.

Since the atmosphere is made up of oxygen, nitrogen [illegible] each of these exerts a partial pressure. Oxygen [illegible] and water vapour pressure, nitrogen and inert gases [illegible]. Since the pressure of air at ground level is due to the [illegible] which exists above it, as we ascend the pressure falls and [illegible] the partial pressure of oxygen. This fall in pressure may produce the following [illegible]:

(1) Expansion of gas in the ear [illegible].

(2) Expansion of gas in the abdomen [illegible] may prove of considerable discomfort if gassy foods are taken before flight.

(3) The bends. A condition due to the release of [illegible] in the blood when the pressure is reduced. In the airman this [illegible] serious, since it can always be relieved by coming down [illegible]. In this respect he is unlike the diver [illegible] descends to the greater pressures and [illegible] his normal habitat.

(4) Altitude sickness or anoxaemia. Absorption of oxygen by the blood varies with the partial pressure of oxygen in the [illegible] this is lowered beyond a certain point it is difficult for the body [illegible] adequate supply for its needs. Now the partial pressure [illegible] mixture depends on (*a*) composition and (*b*) actual pressure [illegible]. So when the partial pressure of oxygen in the [illegible] dangerous level it can be compensated by increasing the percentage of oxygen in the

maximum. The [illegible] process is reached at 40,000 [illegible] altitude an atmosphere [illegible] pure oxygen is at the minimum [illegible] pressure which can [illegible] life. Above this it is necessary for the pilot to be in either [illegible] or in a positive pressure cabin. Rapid breathing will compensate [illegible] extent for the lack of oxygen at high altitudes. However [illegible] respiratory centre is controlled, not by the lack of oxygen but by the [illegible] carbon dioxide in the [illegible] involuntary over breathing will flush this [illegible] blood and depress the respiratory centre, so that after a while there will [illegible] state of Acapnea (lack of $CO_2$) followed by apnoea, which will [illegible] the second state of such a man worse than the first.

The ability [illegible] oxygen lack depends to some extent on the idiosyncracy of the [illegible] any of the undermentioned conditions will, however, lower the [illegible] threshold.

(1) Anaemia. Due to disease or the destruction of the haemoglobin by such gases as carbon monoxide or arseniuretted hydrogen. The former is not often found in aircraft, however, since the effects of carbon monoxide on the human body are cumulative it must be remembered that even a slight penetration of exhaust gases into the cockpit is very dangerous, as the blood takes up carbon monoxide just as blotting paper takes up ink. More dangerous still are cordite fumes, for they contain a higher percentage of carbon monoxide, and these may represent quite serious problems in the modern aircraft fitted with enclosed gun turrets. Apart from these, any excessive use of alcohol, tobacco, or fatigue or staleness will make the pilot become anoxaemic at a lower altitude. The symptoms of the condition are important. Just as Tissandier described sixty five years ago, "there is no suffering." In fact the victim does not realize that he is suffering from lack of oxygen. He thinks that he is perfectly well and absolutely normal. His judgment becomes defective. He develops a spurious self confidence and may be irritable, pugnacious or hilarious. His mental processes are slowed down. A man suffering from oxygen lack cannot do the simplest arithmetical problems. He does not realize that he is in any way other than his normal self. Unconsciousness comes on quite without warning. The pilot, as he descends, may regain sensibility without ever realizing that he has been unconscious. It has been observed in the low pressure chamber that men without oxygen doing some [illegible] exercise will suddenly lapse into unconsciousness. As soon, however, as their oxygen is turned on, they will start again where they left off [illegible] ever having known of the period of their lapse.

When flying without oxygen, the faster the rate of ascent and becoming anoxaemic, the quicker will be the recovery on descending. The slower the ascent, the longer will be the recovery. The more high flying a man does the lower will become his anoxaemic threshold. Thus we see the hideous insidious danger of these conditions. A man does not realize that there is in diving [illegible] other men and can stand [illegible] longer than his fellows takes [illegible] eight his aircraft when the dive [illegible] requirement of the body increases [illegible]. The pilot and observer in an aircraft [illegible] all the time; however in large aircraft the air gunner may [illegible] sometimes doing quite heavy work. He may be quite all right [illegible] but as soon as he moves from place to place the extra oxygen used [illegible] available supply in the blood and he rapidly loses consciousness. Special devices are in preparation to deal with this particular problem.

The effects of centrifugal forces on the human body are unnoticed by those who live on terra firma except on the rare occasions when they go on a roundabout. They may then feel this phenomenon to a very slight extent. Centrifugal acceleration is that which keeps a string taut when a weight is swung round at the end of it.

Centrifugal acceleration = $\frac{V}{R}$ (V = velocity, R = radius of circle) and may be measured in terms of G.

Now the weight of any object is a mass × G where G is the acceleration; on the ground this is produced by the force of gravity and equals 1. In the air it may become as high as 7, so that a man who weighs 180 lb. normally will weigh 1,260 lb. when subjected to 7G. Thus, under these conditions the blood becomes seven times heavier and the heart has the colossal task of pumping this fluid with the same weight as molten iron round its normal circuit. When subjected to these forces the blood supply of the eyes and brain become inadequate and firstly a dimness of vision develops which may go on to complete loss of consciousness. The time factor plays an important part and a far higher value of G can be withstood for short periods than for long ones. Thus blackout is more likely to be experienced in making a steep turn than at the bottom of a dive where the forces are only felt momentarily. The threshold varies with men, and if they are fit is remarkably consistent for an individual. The average man can stand 5G for four seconds. In modern fighting tactics it is necessary to turn quickly and in small circles. So that a pilot who is able to stand (either on account of his constitution or by means of some device) a higher value of G than his opponent has a great advantage over him because he can see clearly while the other's vision is becoming dim and the onset of unconsciousness is nearing. For example, if Brown has a threshold of blackout of 4G and Smith has one of 6G then Smith can turn in a circle of 645 ft. without blacking out, whilst Brown has to turn in 968 ft. This obviously gives Smith an enormous advantage.

In [illegible] only been possible [illegible] the problems which [illegible] on to-day. With the improvement in performance and [illegible] becomes the problem of improving the endurance and performance [illegible] becoming an extremely vital one. So far man has been [illegible] all strains and stresses that have been put upon him, but the time is rapidly approaching when it will not be so much the problem of [illegible] as of improving the men who fly them. [illegible] training and improvement in flying [illegible] conditions it has not been possible to say much [illegible] lines, but there is no question that an enormous amount [illegible] in hand on this subject and is already bearing fruit.

Much [illegible] in this paper has been culled from the R.A.F. course in the [illegible] of high flying, from Aviation Medicine by Major Armstrong, [illegible] States Air Force, and the Air Publications 130, 1269 and 1[illegible].

## NOTES ON THE URGENT SURGERY OF THE HAND

By Surgeon Commander W. V. BEACH, R.N.

"It's only a finger." How often have we heard these callous words! Condemning not only the speaker, but in all probability foretelling disaster for the patient. If a text were needed on which to formulate a plea for the better appreciation and treatment of injuries or infections of the hand, none better could be found. For it indicates the fundamental lack of appreciation of a problem, or a whole series of problems, in every way as important as the acute abdomen. The train of events following on a severe injury or infection of the hand which is maltreated in the first instance can be as tragic, as crippling, or as permanent as any in the field of surgery. It is the supreme importance of this first operation on which, in the words of Bohler, "the subsequent course of the lesion will depend," that prompts me to record these notes, in the hope that at least a few of the many unhappy results which are so frequently seen may be avoided.

In any community of men, such as the fighting and dockyard services, all of whom lead an active existence with a maximum of manual exertion, wounds, and consequently infections of the hand, are extremely common. With wounds I propose to deal but briefly, and in general outline only. They present, together with burns, an immense problem, and in their later stages encroach more and more upon the field of the plastic surgeon. Similarly amputations and fractures will not be considered in this brief survey. It is [illegible] the treatment [illegible] ties are concerned for [illegible] the Medical [illegible] frequently to deal. As a result [illegible] diagnosis [illegible] to see less and less of the [illegible] in [illegible] placed [illegible] which eventually—and [illegible] the [illegible] wards of the hospitals.

## WOUNDS

As mentioned above [illegible] will be [illegible] to deal exhaustively with them. [illegible] will be an attempt to discuss briefly some of the problems [illegible] the surgeon either in circumstances which [illegible] or in the ordinary sick bay.

## WOUNDS INVOLVING SOFT TISSUES [illegible] LESIONS

Frequently one finds that in dealing with wounds of the fingers there is a tendency to dispense with certain of the essential features of adequate débridement. This should never be so. If it is important to excise a wound in any other part of the body it is far more so in the hand, for if once infection becomes established in the fingers and hand the immediate outlook is worse than in almost any other part of the body. This tendency to omit adequate excision of dead or damaged tissues in the hand is probably due to the fear of reducing further the already small quantity of tissue which may have been left by the injury. There is, however, far more incipient danger in leaving infected material in a finger or hand than there is of affecting the viability of the member by adequate débridement.

All dead material which would provide an excellent culture medium for infection should be thoroughly cleaned away and excised. Skin edges should be excised with no less thoroughness than elsewhere, but the thickness of the margin removed should be kept as narrow as possible—1 to 2 mm. Here I would like to stress the necessity of using small instruments and fine suture material to prevent wastage of tissue. Instruments usually associated with ophthalmic work have been found to be ideal for this purpose. This process of cleansing and excision of the wound will nearly always be greatly assisted by the use of a tourniquet—in the case of a finger a soft rubber catheter tied around the base of the finger and clamped with a haemostat, and for a hand by applying a sphygmomanometer bandage above the wrist and inflating it. A strict aseptic routine should be observed. Flaps of skin to be viable should be wide at their bases in every case, and if this is so long tapering ends will probably survive.

The question of whether to suture or leave open a lacerated finger or hand is always a difficult one, and has often to be decided by the condition of the wound [illegible] the hand when the wound was rece[illegible] be stated that after six hours wounds [illegible] cleansing (Iselin). In any case if closure [illegible] sutures the wound is better left open. Wh[illegible] this will have to be remedied by a pedicle gr[illegible] by a free graft held in position by dental wax [illegible]. These and similar plastic procedures [illegible] fingers in the thigh or abdominal w[illegible] these notes. Mention must be made [illegible] the desirab[illegible] adopting some such measure in all irreparable [illegible] amputation [illegible] which would otherwise result in its shortening.

### WOUNDS INVOLVING TENDONS AND NERVES

It is not proposed to enter into a discussion of the pros or cons of immediate or delayed tendon suture. It will suffice to say that the consensus of experience ([illegible] opinion) indicates that while extensor tendons can usually be sutured at once with very good chances of success the flexor tendons should never be so treated but should be repaired at a later date when healing has taken place and no possible sepsis is present. The optimum time for this secondary repair is about three weeks later. One can readily understand this difference in the behaviour and consequently the treatment of the opposing tendons when one considers the small amount of retraction which is possible in a cut extensor tendon due to the aponeurotic extensions to each other over the metacarpal bones. After tendon suture or severance, the hand should be put up in a position of over correction to relax the tension of the injured tendon. In this connection Iselin has reported spontaneous union even in a flexor tendon so splinted. The splint should be removed after four to six days and active movements commenced.

Generally speaking straight splints have no place in the surgery of the hand. Wire splints or plaster which can be bent into the required curvatures are ideal for arm, hand or fingers. Wherever possible or wherever stiffness or loss of function of the hand threatens it is best to keep the hand splinted or plastered in Kanavel's position of function which may be briefly summarized thus: Wrist 60° dorsiflexed. Fingers 60° flexion. Thumb abducted from the palm and the second phalanx slightly flexed.

Though it is not intended to include fractures in this brief survey of wounds it is perhaps not out of place to mention here the deep penetrating wounds of the palm involving both tendons and metacarpals. In these cases as Bunnell has pointed out one is faced with the problem of being unable to repair at the same time the bones, which must be immobilized and the tendons which must be mobilized and one's chief care should be directed first to the bones and for the restoration and preservation of the [illegible] concavity [illegible] metacarpal [illegible] must be [illegible] by bandaging the hand [illegible] of common [illegible] are [illegible] in this position and then [illegible] to suture the divided tendons at a later date.

Nerves should always be sutured at the earliest possible opportunity, and in doing this only the finest needles and silk should be used. Bentley and others have shown that regeneration of fibres is greatly retarded by any thick suture material, especially if it is allowed to pass through the centre of the nerve substance.

Lastly, on traditional and recently fashionable grounds, antitetanic serum and the sulphanilamides may be given as prophylactic against the development of tetanus, and the infections which will now be considered.

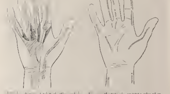
## INFECTIONS

Every whitlow is serious.

Even more so than in the primary treatment of wounds of the hand is it imperative that every doctor entrusted with a scalpel should realize the importance of infections of the hand and the lasting harm which may, and does so frequently, result from failure to appreciate the clinical condition and to treat it along well-defined lines. The following assessment of the problem is from the facile pen of Hamilton Bailey, and is more lucid than any paraphrase of mine could be. Correct treatment rests on correct diagnosis, and correct diagnosis of the location of pus in the hand never comes as a surgical intuition. The treatment of severe infection of the hand is one of the few exceptions where theoretical knowledge is even more important than practical experience. It is the proven truth of this last sentence, as borne out in the work of a relatively inexperienced surgeon, that has prompted this article, in the hope that at least a few patients may be spared the useless superficial scratch, usually down the middle of the finger, in cases of deep suppuration of the hand with which every hospital surgeon is so distressingly familiar.

As a result of experience, certain cardinal considerations in diagnosis and treatment have come to be accepted with very minor variations. These will be considered as briefly as possible. When a severe infection of the hand is first seen, the problem confronting the surgeon is to distinguish between (*a*) Lymphangitis, (*b*) tendosynovitis, (*c*) a fascial space infection.

(*a*) (*b*) In early cases it may be impossible to decide between these two, and in the period of waiting and watching, sulphonamide gr. 15 four-hourly should always be given. There can be no doubt whatever that the subsequent progress of the infection, once established, is very definitely favourably affected by this drug administered *before* surgical intervention. Heat applied to the part, preferably in the form of dry radiant heat, is comforting to the [illegible] between [illegible] lym[illegible] [illegible] tend[illegible] infection [illegible] that in the absence of [illegible] further period [illegible] lymphangitis respond[illegible] whilst [illegible] is an established tendo[illegible] the site of the [illegible] will remain— although [illegible] very great pain will be caused by [illegible] flexed finger. Once a lymphangitis has



[illegible] without lumbrical [illegible] and ulnar bursitis

[illegible] the necessity for accurate differentiation [illegible] disappears as both must be treated surgically, and [illegible] rendered as always bloodless by a tourniquet the surgeon will [illegible] in deciding how deep to continue his incisions.

Before the [illegible] spread or treatment of tendon sheath infections is discussed [illegible] familiar with the anatomical positions of the tendon sheaths [illegible] to form the radial and ulnar bursæ and the canals in which lie the lumbrical muscles. These are best remembered with the help of a diagram. As the recommended incisions are also best remembered in diagrammatic form it will be easy to follow the rationale of these incisions when the two diagrams are considered together.

From the first diagram the special importance [illegible] to infections of the thumb and little finger will easily be [illegible]. Though in a fairly high percentage of anatomical specimens the [illegible] little finger is not continuous with the ulnar bursa and the [illegible] bursae are not interconnected the spread of infection along these channels is seen with great consistency clinically. The pockets formed by the lumbrical canals are also evident, and if undrained will tend to convey infection into the fascial spaces of the hand as will be seen later.

### General Operative Considerations

Absolute essentials are: Adequately prolonged anaesthesia, a bloodless field, good exposure of the sheaths or canals for satisfactory examination.

If a diagnosis of tendosynovitis has been made clinically the tendon should always be exposed for inspection however normal the interior may appear through the sheath. The most virulent type of streptococcal pus is very thin in its early stages and may easily escape detection if an actual opening is not made into the sheath. As indicated in diagram 2 the incision should not be made down the middle of the finger in order to avoid prolapse of the tendon. Similarly it should not be placed too far laterally to avoid damage to the digital neurovascular bundle where the incision crosses it to open the lumbrical canal and to drain the cul-de-sac of the sheath at its proximal end.

Attention must be drawn to the peculiarly misleading pain of subcutaneous whitlow of the second phalanx which greatly simulates a tendosynovitis and may lead to unnecessary opening of the sheath; however if this is borne in mind the error should be avoidable and local incision will be found sufficient. On the other hand in subcutaneous whitlow of the proximal phalanx it is wiser always to extend the incision to drain the lumbrical canal.

Note that the digital incision should extend for a short way into the hand as shown and a little proximal to the interdigital web. As the tendon sheaths expand into a cul-de-sac at their proximal ends it is important that these should be adequately drained. In deciding on which side of the finger the incision should be made pay particular attention to the possibility of lumbrical infection. This is so frequently co-existent with tendosynovitis that the side for incision will usually be determined by the lumbrical which is infected and the incision is then carried into the hand almost to the distal palmar crease. If there are no definite indications for any particular side then the index and ring fingers should be incised on the radial side and the middle and little fingers on the ulnar side. The thumb incision is clearly indicated in position and extent in diagram 2. Care must be taken not to carry this incision too near to the wrist for fear of severing the median nerve supply to the thenar muscles.

As previously mentioned infections of the sheaths of the thumb and little fingers are frequently accompanied by spread to the radial or ulnar bursa, and frequently to both. In the former, in addition to the signs of tendon sheath infection in the thumb, [illegible] swelling and marked tenderness at the wrist proximal to the distal crease of the wrist. In the latter, swelling appears in the wrist with [illegible] marked tenderness can be elicited by pressure over the [illegible] middle and distal [illegible] of the hand (Kanavel's sign). Any suggestion of spread from one bursa to the other is an indication for the opening of both bursae at the same time. This is best achieved by drainage of the proximal ends of the bursae in the forearm as well as in the hand by the incisions shown. The forearm incision on the medial side should start 1 in. proximal to the styloid process of the ulna, and on the lateral side 2 in. proximal to the styloid process of the radius, and extend upwards for 2 in. The finger is thrust through under the deep flexors on to the interosseous membrane where the pus usually collects, and a flat drain left in place. In addition, if the bursae have not spontaneously ruptured they are torn through with forceps.

Recently Henry has described an alternative approach to the ulnar bursa. This is made through an incision along the subcutaneous border of the fifth metacarpal, and the bursa is exposed by retracting and cutting away respectively the abductor and opponens muscles of the little finger. As I have had no experience of this method no opinion is offered as to its use.

### FASCIAL SPACE INFECTIONS

While there are six fascial spaces described, in a short review of this nature it is proposed to discuss only the three most important in any detail. The spaces are: (1) The pulp space, (2) the dorsal subcutaneous space, (3) the dorsal subaponeurotic space, (4) the hypothenar space, (5) the thenar space, (6) the mid palmar space.

It is only with the first and the last two that I shall be principally concerned.

To dismiss the others briefly: (2) and (3). As indicated by their names these potential spaces are found on the backs of the fingers and hand, superficial and deep respectively to the extensor digitorum and its tendinous expansions. Infection of the subcutaneous variety tends to spread rapidly over the back of the hand, but is easily recognizable and should be evacuated early before damage to the extensors has been caused. The subaponeurotic infections tend to remain more localized and respond well to local incision and drainage, and only if they are long neglected does spread to the tendon sheaths take place. (4) This is a somewhat ill-defined space in the tissues which form the hypothenar eminence. Drainage should be effected by a small incision along the ulnar border of the hand and the insertion of sinus forceps.

(4) The important but much abused space extends [illegible] tip of the finger and begins proximally in a fibrous partition which [illegible] the terminal phalanx at the epiphyseal line posteriorly and to the [illegible] a little distal to the interphalangeal crease. Thus a natural barrier [illegible] to the spread of infections starting in the tip of the finger, and unless destroyed by prolonged suppuration without drainage or more frequently still by improper incisions that cut open this barrier, it is capable of confining an infective process to a very small area. Satisfactory drainage is effected by a horseshoe shaped incision over the tip of the finger, starting and ending at least half an inch distal to the interphalangeal crease. Alternatively the pulp of the finger is transfixed within the same limits but the incision is not continued

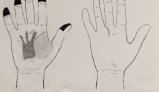


Fig. 5.—Showing the [illegible]

Fig. 6.—Showing the [illegible] for draining the midpalmar [illegible] the [illegible] pulp space.

to include the tip of the finger. Drainage by this method is not quite so satisfactory but the tactile appreciation of the finger is not impaired. In all prolonged suppurations of the hand frequent skiagrams should be taken to observe possible bony necrosis especially in infections of the pulp fascial space.

(5) The important boundary of this space which must be remembered is the medial one, where it is divided from the midpalmar space by a fascial septum attached to the middle metacarpal bone. If this most important and very resistant septum which divides the hand into its two main compart

ments is kept in until the drainage of serious infections becomes a relatively simple and rational procedure. Apart from penetrating wounds which, of course, destroy all natural barriers, infection of the thenar space is seen chiefly as a result of spread from a tendosynovitis of the index finger or thumb. Considerable ballooning of the thenar eminence and the tissues between thumb and index finger is evident, the thumb is excessively flexed and fluctuation can usually be elicited.

Two methods of approach are in common use: the first, which I consider the best, is to split the web between the thumb and the index finger longitudinally and to deepen the incision with forceps until pus is reached. The second is by an incision along the radial side of the index metacarpal on the back of the hand. This incision crosses a very constant vein which may escape notice with the tourniquet in use, but it should always be ligated as it is frequently a source of troublesome hæmorrhage if the dressings are removed the next day.

(6) As already mentioned above, the medial boundary of this space is the key to rational incision and drainage of the hand, and as there stated, it is a fascial septum attached to the middle metacarpal bone. Infection arises chiefly from rupture of the infected tendon sheaths of the middle, ring or little fingers. It is also often caused by deep spread of the subcutaneous whitlow which commonly forms under the calloused skin that develops in the palm over the heads of the metacarpal bones in those engaged in unaccustomed manual labour, and particularly in oarsmen.

As infection is usually conveyed to the mid palmar space via a lumbrical canal, the appropriate web to be split between the middle and ring, or the little and ring fingers, should be decided according to which lumbrical is concerned. If no definite indication exists, make the incision between the middle and ring fingers, thrust forceps into the space, and open the ends as they are withdrawn. In most cases there will also be the appropriate incision necessary for draining the tendosynovitis which has been responsible for the mid palmar spread.

A special warning must be given against being misled by œdema of the back of the hand. It is relatively rare for pus to collect in the back of the hand, and this œdema is frequently incised when the true mischief is in the fingers or palmar spaces. As a result, these incisions heal very poorly and secondary extensor tendon sloughing is a common result of mistaken interference. Elevation of the hand between treatments, or in plaster, will cure the œdema, always provided the proper digital or interdigital incision has been made.

### After treatment

Until recently I have treated all serious hand infections after operation by hypertonic saline baths beginning on the next day. While these certainly [illegible] appearance [illegible] the hand they are [illegible] to the patient The great drawback is that the splint [illegible] be removed and unrestrained movement takes place causing pain and [illegible] possible spread of infection in the sheaths The soaks are followed by glycerine dressings which have the merit of not sticking to the wound [illegible] The soaks are rapidly reduced and finally discontinued about the third day after which dressings are only changed of necessity

Recently the hands have been immobilized in plaster [illegible] and the fingers covered with dorsal or ventral slabs according to the position of the infection present In both cases sulphonamide [illegible] given for forty-eight to seventy-two hours while the infection is still [illegible] I have never found it to be of the slightest use in chronic [illegible] infections If continued for longer frequent blood counts must be [illegible] the surgeon of the development of any blood dyscrasia While [illegible] of the plaster treatment is still limited up to the present I have been unable to find any noticeable difference in the after results of both methods It is perhaps the solution to be found in Bohler's remarks quoted in [illegible] paragraph— that it is the first operation on which the subsequent [illegible] the lesion will depend

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## THE TREATMENT OF PNEUMONIA

By Surgeon Lieutenant Commander R M HEGGIE M.B. R.N.V.R.

It is admitted that pneumococcal pneumonia as a specific [illegible] is not of the same severity in this country as it is in the United States of America Under war-time conditions however especially in the fighting services it has been noted that the moderate character of the condition as experienced in civil life is partly responsible for the casual treatment of pneumococcal pneumonia as met with at present Whether this is due to a lack of understanding of the gravity of pneumonic conditions and their complications in the fact that the sulphanilamide group of drugs is expected to be wholly efficacious in all cases is as yet undetermined One point to be borne in mind is that the loss of a patient should be the exception no matter how severe the illness

The following method of approach will serve as a useful guide to this idea

After examination when it has been decided that the individual is suffering from lobar pneumonia and the number of lobes involved determined radiological examination should be carried out early to corroborate the clinical findings and to obtain additional information regarding the extent of unaffected lung fields diaphragmatic relationship cardiac involvement by measurement, and finally to ascertain the presence or absence of an underlying tuberculous infection.

While the patient is being clinically examined, a specimen of sputum should be obtained in a sterile receptacle. If difficulty is experienced in this, nasopharyngeal swabs should be taken; even ordinary throat swabs suffice. No time should be wasted in inoculating suitable media to discover the causative organism. This should be done preferably at the bedside, and likewise a blood culture made. The patient is caused little or no discomfort.

Bacteriological examination of the sputum should now be carried out to determine the presence of pneumococci and their type. The Neufeld reaction is the one of choice. First, the sputum is broken up by adding to the specimen a small amount of saline (1 to 3 c.c.) and drawing the whole up and down in a capillary tube or small syringe without needle. A series of loopfuls is placed on a glass slide, and to each is added in turn one loopful of the respective types of rabbit serum and a loopful of ordinary Methylene Blue. Lederle Laboratories, New York, through Thackray, Leeds, provide a composite cabinet for the determination of the 32 types. It comprises Group and Type Specific Sera. A positive result is obtained by observing microscopically the swelling phenomenon ("Quellung") of the pneumococcal capsule first reported by Neufeld in 1902. For rapid diagnostic work it is best to put the specimen of sputum up against the types most commonly encountered; these are in order of frequency 1, 3, 2, 5, 8 and 7 in adults, and 1, 14, 6, 5, 4, 19 and 3 in children (Bullowa). Sometimes a positive result is not obtained immediately, the degree of accuracy with agglutinating rabbit sera being 75 to 90 per cent, not only with types 1 and 2 but also with other types (Cruickshank). In such instances direct inoculation of glucose broth should be done and the whole incubated for four, six or eight hours. Where mice are available peritoneal inoculation should be carried out and peritoneal tapping performed at the same intervals of time as the examination of the glucose broth culture.

In 1917 Dochez and Avery reported on the excretion of a specific substance in the urine of patients with Types 1, 2 and 3 lobar pneumonia. This specific substance, now known to be a polysaccharide intimately associated with the pneumococcus capsule, is readily detected by a precipitation reaction between the urine and the Type Specific pneumococcal antisera. This test, which was confirmed in this country by Cruickshank in 1938, may be used but is not to be relied upon as a method of choice for early diagnosis, having proved positive in only 41.5 per cent of cases. It may, however, identify the infecting type when all other methods have failed. Usually the correct typing can be established within thirty minutes of the patient being admitted to hospital.

Further, from a therapeutic standpoint the fact that the pulmonary consolidation is due to the pneumococcus is more important than the knowledge [illegible] in the condition [illegible] lobular type [illegible]. Knowledge of the [illegible] type of lobar pneumonia, possibly of [illegible] in a case of enteric [illegible] the typhoid [illegible] Flexner or Shiga [illegible] the cause [illegible].

The method of treatment [illegible] from the following [illegible] pneumococcus, the [illegible] (immediate blood [illegible] examination) [illegible] principles of treatment.

### Treatment [illegible] Rabbit Serum

Antipneumococcal rabbit serum ([illegible] and unconcentrated) is a very satisfactory and efficient therapeutic agent except in most cases of Type 3 pneumococcal pneumonia.

In the Hospital of the Rockefeller Institute for Medical Research, New York, 1938-39, 100 patients suffering from pneumonia due to pneumococci comprising twelve different types were treated with unconcentrated antipneumococcal rabbit serum. The total mortality was 11 per cent. However, if cases of pneumonia due to pneumococcus Type 3 are excluded, the mortality was only 5.4 per cent.—(4 cases). Of the 26 patients suffering from Type 3 pneumonia treated with serum [illegible]. The fact that these patients died despite adequate treatment indicates that specific antiserum alone is not an entirely adequate therapeutic agent in Type 3 pneumonia. The patients who died other than those in the Type 3 group numbered only four. In two of these empyema was present [illegible] with severe bacteriaemia; one patient had meningitis, and the fourth patient was an elderly man with Type 2 pneumonia who had [illegible] pulmonary lobe when admitted to hospital.

Considerable clinical experience has proved that it is best to administer the required amount of antibody in as short a time as possible. This results in a more rapid defervescence [illegible] and [illegible] a better method of treatment than that of giving serum [illegible] divided [illegible] a twenty-four hour period. Eighteen patients with Type 1 pneumonia were given the required amount of serum within [illegible]. The time required for defervescence was only 9.5 hours. This is less than half the time, 22.6 hours, required for defervescence in Type 1 patients [illegible] treated with concentrated horse serum in divided doses.

The administration of serum has been greatly facilitated by the use of the skin test with the homologous type-specific polysaccharide. The test is used as a guide to dosage of both horse and rabbit [illegible] serum in patients with pneumonia caused by the pneumococcus Types 1, 2, 3, 5, 7, 8

The use [illegible] for determining when [illegible] of serum has been given. In those patients who show a positive [illegible] before the administration of the specific antiserum the test [illegible] as a guide [illegible]. Patients who died of the infection did not develop a positive skin reaction despite the presence of specific antibody in their circulating blood. The skin test in these cases is a valuable prognostic aid. Its main value lies in the treatment of those patients who show a negative reaction before serum administration and in whom serum is effective in initiating recovery. From the appearance of a positive test, serum can be safely discontinued.

### Treatment of Pneumococcal Infections with Sulphapyridine

On the basis of experimental observations in which it was established that a definite protective action was afforded against intraperitoneal infections of mice with pneumococci Types 1, 2, 3, 5, 7 and 8, and a curative effect resulted in patients suffering from pneumococcal infections, the treatment of pneumococcal pneumonia with sulphapyridine was undertaken. The beneficial action of the drug on the outcome of pneumococcal pneumonia seems undoubted; the crisis occurs within twenty-four hours from the beginning of drug administration in the majority of the patients, even though treated at all stages of the disease and despite the presence of bacteræmia. In the case of Type 3 pneumonia, synergism appears to exist between the action of sulphapyridine and specific anti-serum. In three of the writer's own cases of this type sulphapyridine alone failed to result in sterilization of the blood, but this occurred promptly with subsequent serum treatment. It should be noted, however, that the amount of serum used was considerably less than was previously necessary in the serum treatment of patients with Type 3 pneumonia. Nausea and vomiting are an almost invariable accompaniment of sulphapyridine administration and may be severe enough to necessitate the parenteral administration of saline or glucose saline in about one half of the patients so affected. Phases of the toxicity of sulphapyridine are the occurrence of hæmolytic anæmia and acute azotæmia. The occurrence of hæmolysis may be measured by the excretion of urobilinogen. Hæmorrhagic nephritis may be the cause of the acute azotæmic state.

### Treatment of Pneumonia with Sulphathiazole

In a recent article, Volini, Levin and O'Neil report the treating of 169 cases of pneumococcal pneumonia with sulphathiazole and 164 patients with sulphapyridine, 69 of whom were also given serum. The mortality rates in the two groups were 5.3 per cent and 4.2 per cent respectively. They state that sulphathiazole causes the temperature to fall more [illegible] is more effective than sulphapyridine in Types [illegible] pneumococcal infections, whereas sulphapyridine gives better results in pneumococcal pneumonia Types 1 and 3. The discomfort of nausea and vomiting is reduced when sulphathiazole is used.

Pepper and Ham in the treatment of lobar pneumonia, bronchopneumonia and pneumococcal bronchitis found microscopic hæmaturia in four out of 52 cases, while crystals of the acetylated form of the drug were found in the urine of no fewer than twelve. As acetylsulphathiazole is approximately twice as soluble in alkaline as in acid urine, they recommend the giving of alkalis to prevent crystallization in the urinary tract.

### Treatment of Pneumonia with Sulphadiazine

This new member of the sulphanilamide group of drugs has made its appearance in the United States of America, and careful reports on its behaviour have been recorded by Feinstone and by Long. Sulphadiazine is more soluble in blood than sulphapyridine, consequently blood concentrations are considerably higher and more effective. Acetylsulphadiazine is more soluble in urine than either acetylsulphathiazole or acetylsulphapyridine, with the result that complications of the urinary tract are diminished. According to Feinstone the toxicity of sulphadiazine is less than either sulphapyridine or sulphathiazole, while Long reports the entire absence of nausea and vomiting in 80 treated cases. It appears also to be specific for Friedlander's bacillus.

### Illustrative Case Histories

The following cases illustrate the considered and unconsidered approach in the treatment of pneumococcal pneumonia.

*Case I.*—On December 3, 1940, H. M. M., aged 24, was the subject of shivering attacks of varying intensity. There was no fever, pain in the side, cough or rusty spit. On account of an apparently [illegible] he dismissed his ailments lightly. During the next three days, which he regarded as days of indifference, there commenced dry cough, followed on the fifth day of illness by a short irritating cough with slight dyspnoea. He was admitted to the Hospital on the sixth day of illness with a temperature of 102.4° F. and respiratory rate of 30 per minute. Following clinical examination, confirmed radiologically, it was decided that this was a case of bilateral basal lobar pneumonia. The pneumococcus was the causative organism, and the type of pneumococcal pneumonia to be dealt with, Type 3. There was no leucocytosis (W.B.C.s 4,100 per c.mm.) [illegible]. Treatment with sulphapyridine (M & B 693) was instituted, 4 grm. being given within the first four hours, and 1 grm. every four hours thereafter. On the seventh day of illness (second day in hospital), when the patient by this time had received 12 grm. of sulphapyridine, it was noticed that he had developed a distinct dusky, mottled red rash [illegible] the neck and upper part of the body without any evidence of Koplik's spots. It was thought that the condition might be either a rash resulting from the [illegible] sulphapyridine or measles. As he still [illegible] count had fallen to 4,000 [illegible] rabbit serum was consider[ed] [illegible] antipneumococcal serum Type I (L[illegible]) [illegible] obtained within twenty hours [illegible] and although the condition gave [illegible] much better. The skin rash which [illegible] was definitely diagnosed as measles [illegible] faded, and was almost gone on the thirteenth [illegible] fit for discharge on the twenty-fifth day.

[illegible] M., aged 20, on January 29, 1942, was [illegible] taking [illegible] (reported in 194[illegible]) [illegible] admitted from hospital elsewhere with [illegible] bacteriological typing of the causative [illegible] were present in films, no [illegible] period of eleven days had taken 48 grm. of the [illegible] the twenty-first day of illness, following [illegible] agranulocytic angina, and on the twenty [illegible] on account of incomplete resolution of the [illegible] has now been invalided from the Service [illegible] pleuro-pericardial adhesions [illegible] subacute rheumatic attack. Total [illegible] 122 days.

Comment. — The [illegible] of these cases is apparent, as is also the end [illegible]

In the [illegible] approach was followed. On account of the [illegible] bacteriostatic effect, antipneumo[illegible] crisis occurred within twenty hours and [illegible]. Moreover, the globulin fraction of the serum given [illegible] the attack of measles.

In the [illegible] the diagnosis of lobar pneumonia affecting the right [illegible] sulphapyridine therapy was begun without regard to the type of pneu[illegible]. On the twelfth day of illness remark was made to the effect th[illegible] M. & B. 693 has not had much effect"—and this after 78 grm. had [illegible]. The question of the administration of antipneumococcal [illegible] never entertained. As a result, for a period of five days, during which time every effort was being made, with large doses of pentose nucleotide and [illegible] blood transfusions, to combat the agranulocytic angina resulting from the overdose of sulphapyridine, the average range of the patient's temperature was 105° to 106° F., and his condition very precarious indeed. In this case it is only too evident that chemotherapy had been carried to excess, and whereas an apparent crisis had been obtained in a period of thirty-six hours, the commencing secondary elevation which showed itself on the eighth day of illness could have been treated with serum as in the first case.

We would conclude by saying that the treatment of pneumococcal pneumonia depends upon the exact determination of the bacteriological status of the causal organism, the response of the patient to initial treatment, and the later choice of continuing with that treatment or employing combined therapy.

These conclusions are confirmed by a personal communication recently received from the Hospital of the Rockefeller Institute for Medical Research, New York, where during the years 1939-40, of twenty-one cases (of all ages) of Type 3 pneumococcal pneumonia treated by combined serum and chemotherapy, only one patient was lost.

My thanks are due to Surgeon Rear-Admiral Stephens for permission to publish these case notes.

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## PRELIMINARY LABORATORY TESTS ON THE FUNGICIDAL ACTION OF COPPER SULPHATE AND PARA-NITROPHENOL ON DERMATOPHYTES

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ON

## COPPER SULPHATE AND PARA-NITROPHENOL IN THE PROPHYLAXIS OF DERMATOPHYTOSIS

The investigation into the effect of certain chemicals on the growth of human pathogenic fungi was suggested by Surgeon Lieutenant-Commander P. K. Fraser, who was interested in developing a prophylactic bath against fungal infection of the feet. The experiments were carried out on organisms grown on synthetic media. Surgeon Lieutenant-Commander Fraser himself hoped to make tests on human feet, as results obtained *in vitro*, as is well known, may be contradicted by those *in vivo*; e.g. chrysarobin, salicylic acid and cignolin have only a slight lethal effect on organisms cultured in the [illegible]. The [illegible] to the test were copper sulphate and para-nitrophenol [illegible] previously been used as a prophylactic measure. For the [illegible] Melanex (1937) used a 20 per cent solution of copper [illegible] rubbed into the lesion daily for fifteen minutes. Copper sulphate together with sodium thiosulphate has been used in the United States Navy [illegible] potent prophylactic soap against "athlete's foot" but its [illegible] has been questioned. Copper sulphate in high dilutions is effective [illegible] algæ in ponds and as a dust or in solution as a component of Bordeaux mixture and its varieties it is an effective fungicide in horticulture and agriculture. Harada (1934) found that at pH 4·02 in experiments extending over three months it had a fungistatic effect upon the growth of *Trichophyton interdigitale* at a concentration between 1: 710 and 1: [illegible]. Chinn (1938) at a concentration of 0·05 per cent (1: 2,000) used it [illegible] Sabouraud's medium to prevent bacterial growth in cultures of [illegible] fungi. It apparently had no effect upon the latter.

Para-nitrophenol [illegible] has been used for sterilizing untreated hides in the leather trade, a concentration of 1: 20,000 being effective against Penicillium spp. (cf. H. Blank, 1935). Semon (1934) and Marrian (1935) used it for treating interdigital spaces after treatment with 12 per cent salicylic acid in spirit, and Marrian also used it in 2 per cent solution therapeutically as a foot bath for twenty minutes per day for three to four weeks, and also for treatment of infection of the hands.

Unfortunately, owing to the war, the work here described is incomplete and the results for only a few concentrations can be given. The tests were carried out in the Mycological Laboratory of the British Museum (Natural History) with the kind permission of the Keeper of Botany, Dr. J. Ramsbottom.

## METHODS

The [illegible] were *Trichophyton rubrum* (Cast.) Sabour. and *Epidermophyton floccosum* (Harz) Lang. & Miloch., isolated from scales sent me by Surgeon Lieutenant-Commander Fraser from patients in H.M. Navy. An attempt [illegible] *Trichophyton gypseum asteroides* but the strain [illegible] that its use was abandoned. The media employed were [illegible] agar and glucose agar the surface of which was [illegible] Sabouraud's glucose medium, and a liquid medium containing glucose and peptone, all adjusted to pH7. Cultures were [illegible]. The chemical treatment was performed at room temperature [illegible].

[illegible] testing the chemicals were tried, the first experiment [illegible]. In the earliest experiments a known [illegible] was poured on to well grown agar cultures and subcultures on to fresh medium were made after the chemical had been allowed to act for varying lengths of time. This method [illegible] nearly approximating treatment on the human body, but the absorption of the chemical by the agar vitiated the comparison. In later experiments all inocula free from agar and comparable in size were placed in the fungicide in excess, washed in sterile distilled water and [illegible] liquid or solid media. (In a few instances parallel tests were made in which washing was omitted with the expected result that less time was required to produce a lethal effect.) This method is roughly intermediate between that adopted by Burlingame and Reddish (1939) who cut out small squares of Sabouraud agar cultures, flooded them with fungicide for the testing time, washed and then subcultured them, and that employed by Osborne and Hitchcock (1931) who removed the fungi from Sabouraud's agar culture by shaking with sterile water and glass beads, transferring 0.5 c.c. of the suspension obtained to the chemical and then making two transfers of this portion to broth. This method was not followed here as when tested a large proportion of the controls produced no growth.

A point not at first allowed for was the necessity to ensure complete removal of air when the fungi were in the disinfectant, this being particularly important for *T. rubrum* which has a loose fluffy aspect. In experiments made without removing the air with a vacuum pump it appeared that *T. rubrum* was considerably more resistant to the fungicides than *E. floccosum* which has a rough and more easily wettable surface. When complete contact with the chemicals was obtained the difference in resistance between the two fungi was much less.

*Copper Sulphate*

*Experiment 1.*—Sets of four cultures, two on glucose agar and two on glucose blood agar, showing more or less uniform growth were treated with 15 c.c. of hydrated copper sulphate solution of concentrations of 2, 1, 0.5 and 0.3 per cent. The chemical was absorbed by the medium in a day or so and both fungi in all cases continued to grow. The cultures of *T. rubrum* after addition of the chemicals differed in appearance on the blood medium and on glucose medium. On the former they had a moist cheese-like aspect whereas on the glucose medium without blood they are fluffy. *E. floccosum* showed no noticeable difference in growth form on the two media on addition of the fungicide. A week later further quantities of the solutions were added to the cultures so that there was an excess which was not absorbed by the agar but covered the culture surfaces. After five days inocula were taken and subcultured on to fresh medium. No growth was obtained from any of the treatments. That this was due to the action of the copper sulphate and not due to the fungi being submerged by the liquid is indicated by the controls where the [illegible] were treated with sterile water. Subcultures from these made good growths.

The presence of the agar leads to variation and inaccuracy; hence in later experiments small pieces free from agar were shaken with the chemical for varying lengths of time, washed in sterile water and inoculated on to fresh maltose liquid medium.

*Experiment 2.* In the following tests ten tubes were used for each treatment. Small pieces of mycelium and spores of *T. rubrum* and *E. floccosum* respectively were immersed for five hours, twenty-five hours and two days in 2 per cent copper sulphate at room temperature, then washed, inoculated on liquid medium and incubated at 37° C. After the five hour treatment *T. rubrum* grew in all tubes; *E. floccosum* did not grow at all. After twenty-five hours three tubes of *T. rubrum* showed growth but none was obtained for *E. floccosum*. The two day treatment killed both fungi. In parallel experiments using 5 per cent and 20 per cent copper sulphate *E. floccosum* was again killed more rapidly than *T. rubrum*. Using a 5 per cent solution between five and twenty-five hours treatment was needed to kill *T. rubrum* and about five hours for *E. floccosum*. Under the conditions of the experiment for the 20 per cent solution one hour's treatment killed *E. floccosum* but the other fungus grew well even after three hours immersion.

In all other experiments with copper sulphate air was removed by keeping the inoculum immersed in the fungicide in a vacuum pump for the testing time. As might be expected the fungicide was more rapid in effect. Less difference was found between the reactions of the two fungi, although *E. floccosum* still continued to be more readily killed. Whether this was due to its inherent character or merely to the mechanical effect of air still not having been completely removed from *T. rubrum* and so providing it with a protective [illegible] against the fungicide was not ascertained.

From these experiments it appears that five hours treatment is necessary to ensure killing of either fungus in water by 2 per cent concentration; four to five hours for *T. rubrum* and two hours for *E. floccosum* in the 5 per cent solution. Twenty minutes immersion in 20 per cent copper sulphate will probably kill *E. floccosum* but about one hour is required for *T. rubrum*. (See Tables.)

*Paranitrophenol*

Using a saturated aqueous solution of paranitrophenol (Imperial Chemical Industries), when the air in the inoculum was not removed one to two hours immersion were required to kill *T. rubrum* and fifteen to thirty minutes for *E. floccosum*. If, however, all air is removed no growth would result for either fungus after only fifteen minutes treatment. Using a 1 per cent aqueous solution [illegible] thirty to sixty minutes was necessary to kill *T. rubrum* and [illegible] were needed for E. [illegible]. [illegible] was [illegible] small inocula of spores [illegible] washing [illegible] inoculation and incubating [illegible]

[illegible] Are Not [illegible]

2 per cent. [illegible]

| | 5 Hours | [illegible] | [illegible] |
|---|---|---|---|
| E. [illegible] | 9/10 | [illegible] | [illegible] |
| E. [illegible] | 0 | [illegible] | [illegible] |

5 per cent. CuSO4

| | 1 Hour | 3 Hours | 3½ Hours | [illegible] | [illegible] |
|---|---|---|---|---|---|
| E. [illegible] | 10/10 | 9/10 | [illegible] | [illegible] | [illegible] |
| E. [illegible] | 10/10 | 10/10 | [illegible] | [illegible] | [illegible] |

20 per cent. CuSO4

| | 2 Hours | 3 Hours | [illegible] | [illegible] |
|---|---|---|---|---|
| E. [illegible] | 9/10 | 8/10 | [illegible] | [illegible] |
| E. [illegible] | 0 | 1 | [illegible] | [illegible] |

[illegible]

[illegible] per cent. CuSO4

[illegible]

[illegible] per cent. [illegible]

[illegible]

[illegible] per cent. CuSO4

[illegible]

[illegible] per cent. CuSO4 [illegible]

[illegible]

[illegible]

[illegible]

20 per cent. [illegible]

| | W | L | [illegible] | [illegible] |
|---|---|---|---|---|
| E. [illegible] | 6/10 | [illegible] | [illegible] | [illegible] |
| E. [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

[illegible] Are not Mechanically Removed [illegible]

| | 1 Hour | 2 Hours |
|---|---|---|
| [illegible] | 5/10 | 0 |
| [illegible] | 0 | 0 |

Repeated [illegible]

| | 15 Minutes | 30 Minutes | 15 Minutes | 1 Hour |
|---|---|---|---|---|
| [illegible] | 1/10<br>Delayed<br>growth | 0 | 1 | 0 |

[illegible] Solution Para Nitrophenol [illegible]

| | 15 Minutes | | 45 Minutes | | 1 Hour | |
|---|---|---|---|---|---|---|
| | W | L | W | L | W | L |
| [illegible] | 0 | 0 | 0 | 0 | 1 | 0 |
| [illegible] | 0 | 0 | 0 | 0 | 0 | 0 |

[illegible] after Treatment in [illegible]

1 per cent Aqueous Para nitrophenol

| | 15 Minutes | | 30 Minutes | |
|---|---|---|---|---|
| | W | L | W | L |
| [illegible] | 10/10 | 4/10 | [illegible]/10 | 0 |
| [illegible] | 4/10 | 2/10 | 0 | 0 |

In another experiment 10 cultures of each fungus on agar slants were treated daily for one minute with 1 per cent aqueous solution of para nitrophenol subcultures being made after each treatment and kept at 37° C *T rubrum* grew after the first treatment only *E floccosum* did not grow at all

### Discussion

Assuming that copper sulphate and para nitrophenol have a similar fungicidal action when applied to the human body as when used in the test tube the question arises whether they can be safely used in sufficiently high concentration to be of prophylactic value

A 20 per cent solution of copper sulphate in glycerine (Moloney *loc cit*) apparently can be applied safely therapeutically but an aqueous solution would probably produce irritation From fifteen to sixty minutes treatment was the time needed to kill the two dermatophytes tested at this concentration in the laboratory and three to four hours at 5 per cent hence it seems dubious whether a bath lasting from one to two minutes would be effective However if baths were used daily there would be a considerable accumulative effect as a certain amount of the salt would remain after the feet were dried

The same would apply to para nitrophenol The possibility of these substances themselves causing dermatitis must however be determined Another objection to these salts is the vivid coloration produced These objections [illegible] high concentration [illegible] possibly be [illegible] chemical to the skin by [illegible] [illegible] then it could be used at very [illegible] with [illegible] application. In the experiments [illegible] 2 per cent copper sulphate solution was lethal in effect in [illegible] per cent [illegible] under five days.

It will be noted that in the experiments [illegible] higher concentrations of copper sulphate were being used [illegible] used in his tests. Only an abstract of his paper has been [illegible] but the experiments show that the effects were accumulative over a period of three months, and fungistatic rather than fungicidal action is measured.

### SUMMARY

A maximum of five hours' treatment was necessary to kill *T. rubrum* and *E. floccosum* in the laboratory using 2 per cent. copper sulphate solution. Four hours or a shorter time for *E. floccosum* was the maximum time needed for a 5 per cent. dilution. Using 20 per cent. copper sulphate solution half hour application is lethal to *E. floccosum*, while about one hour's treatment is required to kill *T. rubrum*. For concentrations of 0.3, 0.5 and 1 per cent. less than five days' application would result in death.

For para-nitrophenol, using an approximately saturated solution, from one to two hours' treatment was needed to kill *T. rubrum*, and half an hour for *E. floccosum*. When treatment was carried out *in vacuo* fifteen minutes sufficed to kill both fungi. When applying 1 per cent. solution of para-nitrophenol thirty to sixty minutes were required to kill *T. rubrum*, and thirty minutes for *E. floccosum*, treatment being performed *in vacuo*.

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## COROLLARY

## COPPER SULPHATE AND PARA-NITROPHENOL IN THE PROPHYLAXIS OF DERMATOPHYTOSIS

By SURGEON LIEUTENANT-COMMANDER P. K. FRASER, M.D., R.N.

In her paper in this issue of the Journal Miss Stephens records some interesting results from experiments on the fungicidal properties of copper sulphate and para-nitrophenol. Originally it had been intended to run a parallel series of fungistatic controls but these were finally discarded as being of no practical application. In practice it is extremely difficult to state when a fungus [illegible] though still viable [illegible] extended [illegible].

The [illegible] copper salts on [illegible] the [illegible] amorphous [illegible] sterilization [illegible]. The [illegible] can be seen [illegible] table. One [illegible] alteration of [illegible] in treated [illegible] speculation [illegible] enough [illegible] consequent [illegible] properties. Such [illegible] in the [illegible] by Salzberger in American [illegible] of decreased [illegible] could only be [illegible] the reproduction [illegible] cases in animals [illegible] in one case it is generally recognized that pathogenic fungi tend to lose [illegible] in culture, which [illegible] is extremely difficult.

The increased [illegible] of the [illegible] method raises the question of surface tension in the fungicidal solution. It will be noticed that the cultures were allowed to [illegible] after [illegible]. With this method some cultures were treated with [illegible] potash and it is intended to carry out clinical trials with this method. For various reasons we were unable to do this.

The satisfactory results obtained from the copper sulphate glycerin method in treatment [illegible] fungicidal [illegible] and such conditions could be reproduced in prophylaxis by the addition of a small percentage of caustic potash or 1:100,000 [illegible]. Sodium [illegible] has also been suggested as an alternative method of lowering surface tension.

Pentachlorophenol [illegible] proposed by the [illegible] and [illegible] phenol in the [illegible]. In a [illegible] form [illegible]. It can be obtained commercially from Imperial Chemical Industries as a yellow powder due to the presence of the [illegible] salt. In the pure form pentachlorophenol is a colourless crystalline compound with a maximum solubility of 1.5 per cent in water. The pH of this solution is about 8.0. A 2 per cent solution in alcohol is the usual therapeutic strength. The addition of caustic potash produces a deep yellow colour which is not an insuperable objection on the feet. Inorganic [illegible] render the solution colourless. As far as is known it has no irritant effect on the skin in the usual dilutions.

## Discussion

The lack of correlation between fungicidal action *in vitro* and in [illegible] general experience in investigations of this kind. Whether this [illegible] failure to reproduce natural conditions in the test tube or whether the action of most fungicides is an indirect one as on [illegible] it is difficult [illegible]. In the fully developed disease the fungus burrows superficially and was be partly protected from [illegible] chemical [illegible] in the pro- dromal or prophylactic stage [illegible] certain control [illegible] Theoretically this should render the pathogen more [illegible] chemicals and the latter [illegible] more closely.

Cumulative action is a factor to be reckoned [illegible] exposures in low dilution [illegible] strengths. From a prophylactic standpoint [illegible] water is the most effective preparation [illegible] potash or other substances [illegible] conditions.

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## SURGERY BY A NON-SURGEON

By Acting Surgeon Commander T. C. LARKWORTHY, [illegible]

This is in no wise a treatise on surgery, even [illegible] attempt at telling a short tale of some experiences from [illegible] of interest may emerge. There are many whose experiences [illegible] and more exciting than mine, but I hope even they may find [illegible] in the other man's tale.

Since I first went to sea one surgical emergency I dreaded [illegible] abdomen. I am not a surgeon by trade and can [illegible] though like most general practitioners second [illegible] general surgery.

One fine day my bogy materialized in the form of [illegible] It could not have happened at a more inopportune moment [illegible] number of soldiers on board [illegible] crawled out, the sea in one of its unkindest moods, and [illegible] far from well.

There was no doubt about the diagnosis. A young [illegible] had been awakened in the morning watch with [illegible] Throughout the day his condition became more typical [illegible] rigidity in the right iliac fossa with a slowly rising temperature [illegible] rate. Surgical intervention was obviously necessary, [illegible] presenting a real problem. The nature of our mission [illegible] back or deviation from our course, and the sea conditions [illegible] for abdominal surgery. The only obvious solution [illegible] reached calm waters in the evening, though this [illegible] advantages, for apart from getting rid of our position [illegible]

[illegible] evidently risen from these. [illegible] after the op[illegible] [illegible] to be in either way [illegible] and pr[illegible] [illegible]ordingly.

The [illegible] had [illegible] prepared as for [illegible] the central cots [illegible] table rigged [illegible] to look as [illegible] as possible. [illegible] sterile [illegible] prepared. These had been [illegible] biscuit tins [illegible] very efficient [illegible] for the [illegible] article, and [illegible] there [illegible] the ship's dis[illegible] supply the necessary heat. We had [illegible] sterile towels [illegible] patient [illegible] However [illegible] right from the [illegible] uppermost [illegible] the parts [illegible] I understand this is perfectly legitimate [illegible] such circumstances.

The only part of the operation about which I was quite happy was the [illegible] expert. He decided to induce with [illegible] the "rag and bottle."

[illegible] there was nothing left to do except wait for a [illegible].

W[illegible] and we were just about to commence the [illegible] upset. Two ratings had been severely [illegible] side. Both had sustained comminuted frac[illegible] compound and the other simple. All thought [illegible] shelved, and the patient was relegated to [illegible] received attention.

I [illegible] comment on splints as supplied for service [illegible] W[illegible] I was surprised not to find a Thomas's splint [illegible] to have some made by the blacksmith [illegible] thinking only in terms of treatment on shore [illegible] appreciated the difficulties to be encountered [illegible] fractured leg on a Thomas's splint in a Sick Bay cot. For [illegible] a man of normal height there is not enough room in the [illegible] the splint, and though there is no objection to the splint [illegible] the end of a hospital bed it is not feasible in a cot. If they [illegible] supplied there would be room for only a few in the normal Sick Bay [illegible] size to take the longest leg. Another point is that trac[illegible] when the ship is at sea is also impracticable owing to the [illegible]. Thus the only way of using the splint to apply traction [illegible] the end of the splint itself, as indeed I believe was the original idea of the inventor. Added to this, there must be few orthopædic surgeons who [illegible] the use of the traction pin under ordinary conditions [illegible] of the patient, and the old-fashioned method of [illegible] by strapping [illegible] to commend it. [illegible] of that [illegible] and under ordinary circumstances [illegible] I am certain that the [illegible] the [illegible] that the orthopaedic surgeon in hospital can begin with a clear field without having to undo work which must of necessity be inadequate. I am only referring to those fractures which need continuous [illegible] reduce the deformity or maintain their position afterwards [illegible] of the most useful and practical [illegible]

Both the men were given morphia [illegible] before being moved, and by the time they reached the Sick Bay they were beginning to feel [illegible]. The compound fracture had been caused by [illegible] violence, and there was a total loss of [illegible] over the site of fracture for an area of about [illegible] in diameter [illegible] surface of the lower third of the tibia. [illegible] edges together, and the wound was [illegible] removed. After dressing the wound the leg was put up in [illegible] the man given an injection of A.T.S. The [illegible] caused by direct violence, and seemed to [illegible] a much greater degree of comminution. [illegible] and both cases travelled very comfortably [illegible] or two later.

After this was over the appendix [illegible] the Sick Bay having been prepared once more the operation began. [illegible] of events, operating on an acute appendix [illegible] be tolerated, but this is in effect what [illegible] casualties could not very well be moved.

Nothing of particular note took place during the operation. [illegible] longer than is usual under ordinary circumstances, [illegible] expert, though even he might have been a little [illegible] difficulties. An assistant who had never [illegible] before assisting a surgeon who had never before performed the operation on his own, in their turn being assisted by [illegible] Sick Berth [illegible] knowledge of surgical asepsis was but primitive [illegible] expert in the party, as I have already mentioned, [illegible] no surgeon could have wished for a better [illegible]

I approached through a right-sided [illegible] difficulty located the appendix behind the caecum. [illegible] were very hard to find owing to old adhesions, and I had [illegible] amount of guess-work over the ligatures. [illegible]

[illegible] should have to abandon the [illegible] This is a diffi[illegible] suppose it is due to some [illegible] where I am writing. [illegible] supplied. No doubt it [illegible] the [illegible] in which it was [illegible] He got snapped off [illegible] pieces. The [illegible] is [illegible] However, I have still [illegible]

[illegible] thankful [illegible] The [illegible] days later.

[illegible] different [illegible] is the [illegible] contingents [illegible] but unfortunately could [illegible] Station could not be found [illegible] amenities of the Sick Bay [illegible] would have it the Sick Bay [illegible] to be borne by the after [illegible] with casualties had been [illegible] to deal with [illegible] by no means small. I [illegible] Aid and Sick Berth [illegible] medical war organiz[illegible] the accommoda[illegible] things should be [illegible] from damage and [illegible] much confusion. We [illegible] Room and the Marines Mess deck. [illegible] good lighting and [illegible] were [illegible] and bedding were [illegible] In addition [illegible] the [illegible] green [illegible] healthy [illegible]. It was [illegible] I had [illegible] way [illegible] employed [illegible] for [illegible] game [illegible].

[illegible] For this [illegible] than I but [illegible] nursing in the [illegible] drinks in providing hot drinks for the [illegible] ship's company. A rapid supply of hot drinks [illegible] to the wounded and I may also say in the medical [illegible] is most important and one which is [illegible] quickly.

Before passing on to the purely medical aspect [illegible] there are one or two small points in connection with the [illegible] I think worth mentioning. Bed bottles are always [illegible] case at least half the number are destroyed [illegible] found. We used the drinking water bottles from officers' cabins [illegible] proved to be most efficient. Only one man threatened to fail [illegible] but after the catheters had been boiled a particularly persuasive [illegible] achieved success with one of the bottles. Bed pans presented [illegible] for after morphia everyone was nicely constipated. This is not altogether a desirable effect from the general point of view but under such difficult circumstances it is one which saves an immense amount of trouble. An ordinary teapot makes a very good drinking vessel for anyone unable to sit up.

At first it was not easy to extricate the wounded and before this could be attempted I spent some time crawling about amongst them giving morphia. I gave at least half a grain to each man and though some of them may have had more than their fair share in the confusion no harm seemed to result. It was quite impossible to keep any record at the time of the doses given. For one thing the recorder with his labels was no more and all that time I was working quite alone. Added to this owing to the outbreak of a number of small fires in the vicinity there was a perfect deluge of water pouring down from the fire hoses above and any attempt at writing under such conditions was merely a waste of time.

When the situation had straightened itself out a little many helpers came forward and we were able to move the wounded aft. For this purpose we found the Neil Robertson stretcher to be the only one of any practical use.

At about this time we were joined by a medical officer and his Sick Berth Petty Officer from a neighbouring ship and with their added help the wounded were stowed away under cover in the spaces already mentioned

There [illegible] for flesh wounds other than [illegible] the injuries fell [illegible] into the following categories: Head injuries, fractures and burns. Some had all three, whilst others more fortunate only one or two. The head injuries were of all grades from very severe fractures to concussion and minor scalp wounds. For the former little could be done in the way of active treatment except to treat shock and attend to the wounds. These accounted for most of the deaths on the way back, and indeed some could be claimed to be only just alive when recovered from the wreckage. Only one scalp wound gave us any anxiety. This was in an elderly A.B. whose scalp was cleft from the frontal region nearly to the occiput. I do not know how many mattress sutures we put in during the night, but the more he haemorrhaged the more cheerful he became, sitting up grinning all over his face. He was a very rubicund individual, so perhaps it did him good.

Apart from the skull, the fractures were mostly confined to the lower limbs. Two amputations were performed of the leg, but the limbs were so badly pulped that this only amounted to cutting through soft tissue. Both the cases were more or less moribund at the time and both died soon afterwards. For the other broken limbs little more than first aid could be attempted. At least half of our splints had been destroyed, and anything made of wood had to be cut up and used. The compound fractures were dealt with as faithfully as possible, and on the whole I think they were all fairly comfortable when we had finished our task.

It is to be regretted that we were mostly caught without our anti-flash gear in place. We had all religiously worn it for some days, but man must eat, and we were engaged in this pastime during a lull when the catastrophe took place. Thus there were many unavoidable burns, though for the most part of a minor character. The face, neck and hands were the parts most affected, and many of these were treated as walking cases. Others, however, were less fortunate, and one man lost his sight from this cause. No extensive cleaning up under general anaesthesia seemed to be a practical procedure at the time, but under the influence of morphia a certain amount was achieved. The burnt surfaces were covered with cod liver oil, and in some of the minor cases flavine. These may not be the modern methods of choice, but it was rather a question of using what we could find. One word about morphia. It was used freely and made all the difference to the wounded. Lying on the deck in a rough sea with a broken leg is not very comfortable, and prolonged pain taxes the strength of the toughest individual. Before their discharge ashore every man, save those in whom it was contra-indicated, was given half a grain to help him on his way. At first thought this may seem to be a large dose, but there is a very big difference between the peace and quiet of a hospital ward and conditions at sea.

I cannot leave this tale without reference to quite a different kind of injury which [illegible] I [illegible] have been in an earthquake [illegible] people [illegible] state of complete apathy. [illegible] having no interest in their surroundings, and in many [illegible] will not even bother to remove themselves from imminent danger. Similar effects have been reported from ships damaged by underwater explosions, in which otherwise unharmed men have made no attempt to escape from flooding or damaged compartments. If given a sharp command they will obey, but they are liable to lapse into their apathetic state again if given the chance. In my own experience this effect was seen in a very mild form, but in no case did it reach such proportions as to endanger life. The majority of the ship's company could be found sitting about on the upper deck like the man who sometimes sits and thinks, but more often just sits. I think most of us were affected like this in some degree, and looking back on it all now I realize that I suffered to a certain extent myself. It is hard to [illegible] so easy to go and sit in a corner and think of nothing in particular. At least that is what I felt inclined to do, but with so much work on my hands I did not have the opportunity of doing so. I think this question is of importance, for it does not appear necessary to be particularly close to the scene of damage to be so affected. Thus men may be absent from their place of duty and slow in obeying orders, and if their state is not appreciated an injustice may occur. I mention this with all reservation for my [illegible] experience is very limited. No doubt there are many others who are in a position to give a better opinion.

It is easy to be wise after the event and I realize more and more my shortcomings in dealing with this situation. I have learnt a lot from my experiences and sincerely hope these few remarks may help others to avoid my more obvious mistakes.

◆

# Clinical Notes and Cases

## CHRONIC CONSTRICTIVE PERICARDITIS

[illegible] H. LOVELL HOFFMAN, M.B., M.R.C.P., R.N.V.R.

AND

[illegible] COMMANDER J. COLVER, M.D., M.R.C.P., R.N.V.R.

[illegible] Guy's Hospital [illegible] [illegible] know [illegible] [illegible] his symptoms [illegible] his signs and [illegible] [illegible] this [illegible] [illegible] often [illegible] [illegible] patient [illegible] [illegible] [illegible] the following case [illegible] [illegible] as a result of [illegible]

[illegible] past history [illegible] [illegible] illness. He [illegible] [illegible] one illness [illegible] [illegible] [illegible]

[illegible] 1939 when he [illegible] [illegible] of the chest on [illegible]. He was [illegible] He recovered [illegible] and until February 1941 [illegible] his medical [illegible]. During this [illegible] increasingly short of breath [illegible] [illegible] when he was swimming. Owing [illegible] where obliteration of the right [illegible] due to pleural adhesions. The [illegible] November 21, 1941, he reported [illegible] [illegible] Temperature 100° F., pulse [illegible] to R.N. Hospital, Haslar, on the [illegible] left lung there were dullness to per[illegible] [illegible]. A pleuro-pericardial rub was [illegible] developed. The neck veins [illegible] enlarged and tender. X-ray [illegible]. A diagnosis of acute per[illegible] and [illegible] had settled he was transferred [illegible] Hospital [illegible]. In some [illegible] towards [illegible] slightly raised pulse rate between [illegible] temperature [illegible] suggesting an active [illegible]

[illegible] picture. His [illegible] [illegible] were prominent and [illegible] of the veins of [illegible] 114 [illegible] [illegible]

[illegible]

[illegible] dyspnoea some months [illegible] enlarged liver which [illegible] at the onset of the [illegible]

[illegible] the following [illegible] of the [illegible]

[illegible]

## [illegible]

[illegible]

[illegible]

[illegible] Rump Brachial [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] position.

[illegible]

[illegible] DYSENTERY IN A HOSPITAL [illegible]

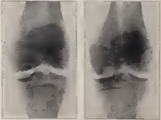
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



A B

[illegible]

[illegible]

## A CASE OF SILICOSIS WITH BILATERAL PNEUMOTHORAX

By Surgeon Lieutenant G. A. [illegible], R.N.V.R.

W. J., aged 56, Stoker, was admitted to R.N.H. Plymouth in January 1940.

He suffered from dyspnoea on exertion, extensive productive cough, night sweats, general debility.

*Past illnesses.*—Influenza, trench fever.

He started work at the age of 14. He worked from 1898 to 1901 in coal mine in South Wales; 1901 to 1904 in Army, served in Boer War; 1904 to 1914 in gold mines in South Africa; 1914 to 1919 in Army in France; 1919 to 1926 drove a lorry in England; 1926 to 1939 served as stoker in Merchant Navy; 1939 to 1940 as stoker in R.N. (under T. 124 agreement).

*Clinical Examination.*—Tonsils: No enlargement. Teeth: No evidence of gross infection. Heart: Apex impulse not felt. No murmurs. Rate normal. Cardiac dullness decreased. Lungs: No dullness. Emphysematous type of chest. Few crepitations and catarrhal sounds over upper half of both lungs. Abdomen: Nil abnormal found. C.N.S.: No abnormality found. No clubbing of fingers or toes. Temperature and pulse normal whilst in hospital.

*Investigations.*—Urine: Normal. Blood count: Haemoglobin 100 per cent; R.B.C. 5,030,000; colour index 1; leucocytes 9,160. Sedimentation rate 25 mm per hour. Sputum: Repeated tests for tubercle bacilli were negative. Stools: Repeated tests for tubercle bacilli were negative. X-ray shows: Peaking of both diaphragms. Well marked silicosis present with small right and left pneumothorax and obliteration of pleura in these areas. Fibrotic changes in both lower zones with compensatory emphysema. Heart shadow pulled over to right side.

The interesting features of this case are:—

(1) The X-ray film. (2) Extensive disease as shown by X-ray, associated

with [illegible]

[illegible]

[illegible]

[illegible] of the lung [illegible] right and left pneumothorax and calcification of the pleura [illegible]

[illegible]

[illegible]

[illegible]

## A CASE OF PARAGONIMIASIS

By [illegible] Lieutenant-Colonel [illegible] M.R.C.S. [illegible]

[illegible] was by the [illegible] of China [illegible] The diagnosis [illegible] by this [illegible]

*History.* [illegible] 1940 [illegible] hæmoptysis. He [illegible] found [illegible] about a [illegible] found. Nothing [illegible] hæmoptysis [illegible] darkly blood [illegible] in the chest [illegible] symptoms for [illegible] loss of weight [illegible] planning of [illegible]

There was no previous [illegible]

He had served in the [illegible] in [illegible] 1931-33 [illegible] Mediterranean 1934-36 [illegible] in Home Stations.

*On Examination.*—He [illegible] There was no clubbing of the [illegible] normal. No abnormality [illegible] cardiovascular system [illegible] accompanied by thrill [illegible] normal in contour [illegible] of breath sounds [illegible] left upper and middle zones [illegible] Vocal resonance was normal [illegible]

*Investigation.*—Sputum [illegible] mentation rate [illegible] Hb. 89 per cent [illegible] per cent [illegible] 4 per cent. Bilirubin [illegible] urine and acid [illegible] some patchy opacity [illegible] broncho-pneumonic consolidation.

*Course.*—Five days after [illegible] blood. At the same time [illegible] but no constitutional disturbance [illegible] rales and rhonchi [illegible] within forty-eight hours [illegible] by altered blood. On the [illegible] contained fresh blood and [illegible] sputum had been [illegible]

[illegible] was found to contain [illegible] the following day [illegible] further [illegible] by fresh blood. Subs[illegible] [illegible]

[illegible] [illegible] 1940 and [illegible] [illegible] was [illegible] course [illegible] There was [illegible] other symptoms [illegible]

[illegible] This [illegible] occurs [illegible] discharged. If [illegible] containing fresh [illegible]

[illegible] development of the [illegible] and a crab or [illegible] the latter in a raw or imperfectly [illegible] shellfish of any kind. It is [illegible] the result of drinking water into which [illegible] of the second intermediate host.

I [illegible] Surgeon Captain H. B. [illegible] for permission to publish this [illegible] for the laboratory investigation.

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## COMPOUND DENTIGEROUS CYST INVOLVING THREE MISPLACED UNERUPTED TEETH OF THE NORMAL SERIES

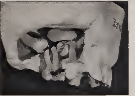
By Surgeon Commander D. DOUGLAS HALLON, M.R.C.S., L.R.C.P., R.N.V.R.

The patient, a naval rating aged 22, was admitted to a Hospital Ship on account of a swelling of his upper right jaw. Clinical examination showed what would appear to be the following teeth present in his right maxilla $\underline{7\ 4\ 2\ 1|}$, a space being present on either side of $\underline{4|}$. A large swelling which seemed to be of a cystic nature involved the whole area posteriorly from $\underline{4|}$ and extended both buccally and palatally. The $\underline{7|}$ was very carious. X-ray examination revealed the presence of three unerupted teeth, a molar, a premolar and a canine, in a loculated cavity.

Under a regional anæsthetic the very loose $\underline{7|}$ was picked out. Alveolar process was attached to the palatal root as well as a small plate of bone to the buccal aspect. A granuloma was attached to the buccal roots. $\underline{8|}$ was the next tooth to be removed, lying visible in the posterior aspect of a cavity continuous with the socket of $\underline{7|}$. $\underline{5|}$ was then extracted, its root being at right angles and wrapped around the root of the erupted $\underline{4|}$. Finally, lying in what would appear to be the antral floor was $\underline{3|}$, which was also removed.

The remnants of what appeared to be a cyst lining were picked out, the cavity curetted and swabbed with pure phenol. Three loose silkworm gut sutures were inserted to approximate the edges of the wound.

[illegible]



[illegible]

[illegible]

[illegible] on purpose and [illegible] teeth, but [illegible] been erupted or [illegible] in place at the time [illegible] years approximately [illegible] could not have commenced [illegible] at least some years [illegible] attached to [illegible] this case there would [illegible]

As cysts get large [illegible] or even disappear [illegible] pathologist's finding.

[illegible]

[illegible]

---

## [illegible] MALARIA

[illegible] M.B., R.N.

[illegible] M.B., R.N.V.R.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] batt[illegible]

On [illegible]

On [illegible]

On [illegible]

[illegible] M. A. B. [illegible] in Bermuda [illegible] from the [illegible] of Mino [illegible] November [illegible] 102° [illegible] pulse 84 [illegible] temperature 104.6 [illegible]

[illegible]

[illegible] 11,200 [illegible]

[illegible]

[illegible] Next [illegible] ones [illegible] sence [illegible] of the [illegible] tablets [illegible] three days [illegible] There [illegible] improvement in the [illegible] symptoms [illegible] of [illegible] tablets [illegible] gr. 30 [illegible]

[illegible] 3,140,000 [illegible] 64 per cent.

[illegible] per cent. (No correction for [illegible])

[illegible] the patient was invalided to the United Kingdom [illegible] the end of the [illegible]

[illegible] 3.—[illegible] 21, 1939, from West Africa [illegible] 1937. From 1920 to 1937 he had resided [illegible]

[illegible] the [illegible] and [illegible] with [illegible]

[illegible] and [illegible] moderate [illegible] on [illegible] The W R [illegible] and [illegible] symptoms were [illegible] became [illegible] he became [illegible] hospital [illegible] examination [illegible] temperature 102 [illegible] found [illegible] heart [illegible] of the nervous [illegible] blood showed [illegible] infection with [illegible] was given two [illegible] (0 1 gr [illegible] The next [illegible] still drowsy and [illegible] given [illegible] intramuscularly [illegible] in the [illegible] in the [illegible]

On this [illegible] the number of parasites [illegible] very drowsy and showed [illegible] He was now [illegible] all the reflexes [illegible] The pupils did not react to light or accommodation He [illegible] nursing for cerebral malaria and at 6 30 p m 10 gr of quinine [illegible] intravenously This dose of quinine [illegible] with 5 gr intramuscularly

At [illegible] on July 2 he regained consciousness [illegible] temperature was normal

He received [illegible] of quinine [illegible] commenced a full course of atebrin

Recovery was uninterrupted

*Case 4*—A woman aged 4[illegible] [illegible] April 19[illegible] from Assam where she had been residing [illegible] She had a history of frequent attacks of malaria during the [illegible] abroad but for the last eight years she had been [illegible]

On May 12 she was [illegible] nothing abnormal was found in the [illegible] blood [illegible] 88 per cent and the red blood cells 4 000 000 On May 30 and 31 and on June 2 she had slight shivering attacks followed by mild pyrexia and headaches

The blood was examined on June 2 and showed large amœboid rings suggestive of benign tertian parasites as well as [illegible] subtertian parasites The hæmoglobin was 86 per cent Physical examination showed her to be a healthy looking woman with a slight icteric tinge The tongue was coated and the spleen enlarged The temperature was 99 6° F

She was admitted to hospital and the next day started a course of quinine by the mouth and plasmoquine About 6 p m the next day June 4 she became very hot and perspired profusely—moreover she was quite drowsy The temperature was 103° F The urine [illegible] and showing bands of oxyhæmoglobin [illegible] plasmodia [illegible] large [illegible] times.

[illegible] the count became red [illegible] liver [illegible] the last [illegible] persisted [illegible]

[illegible] this [illegible] June [illegible] hours [illegible]

[illegible] enlarged [illegible] 16 [illegible] feeling [illegible] and by [illegible] 20 [illegible] impalpable.

## Discussion

It is [illegible] be [illegible] mild symptoms and [illegible] to find parasites in the blood [illegible] in people suffering from [illegible] long periods in malarious places [illegible] the parasite [illegible] frequent infect[illegible] the first attack [illegible] aches or loss of energy [illegible]

Case 1 illustrates [illegible] infection and [illegible] explanations [illegible] sensation [illegible] possess a part[illegible] typical attacks of ague [illegible] merely joint pains [illegible] feeling of [illegible]

The second fact that the [illegible] duration of a mild attack is [illegible] have already said for [illegible] of parasites may produce [illegible]

However [illegible] the case of malignant [illegible] and mostly in those of the [illegible] sack and adhere to the wall [illegible] This blocking may occur [illegible] of the brain giving [illegible]

Although serious [illegible] this is not necessarily [illegible] malaria where a comparatively small [illegible] symptoms due to [illegible] pernicious vomiting [illegible] of malignant tertian malaria [illegible] endemic areas there are [illegible] However at any time under [illegible] give rise to conditions [illegible]

In addition further [illegible] already discussed.

Firstly the occurrence [illegible] the cases obscured the [illegible]

Secondly the effects [illegible] significance of the [illegible]

## [illegible]

[illegible] and the [illegible]

[illegible] the [illegible] his [illegible]

[illegible] throat [illegible] had [illegible] some [illegible] was [illegible] septicemia [illegible] seems [illegible] he was [illegible] normal [illegible]

[illegible] 10 000, [illegible] no [illegible] per cent, [illegible] 1 per cent [illegible]

[illegible] improved [illegible] sudden [illegible] follow [illegible] evening [illegible] per [illegible] chloride gr 10 fol[illegible] the next day the temper[illegible] disappeared and [illegible]

Blood [illegible] white blood cells 6 400 Hb [illegible] per cent

On examination [illegible] the injury it was found that the patient had [illegible] seven months previously [illegible] quently He had not been [illegible] given two courses of [illegible] interval between The [illegible] and 30 per cent He [illegible] was 2[illegible] per cent at that time [illegible] symptoms of stiffness aching [illegible] 99° F and four hours later 101[illegible]

A blood [illegible] parasites There was no [illegible] starting on August 17 The patient [illegible]

Periodic readings [illegible] 20 per cent September 5 [illegible] September 30 [illegible] per cent October 1[illegible]

[illegible]

## [illegible]

[illegible] before a [illegible] cured [illegible]

[illegible] the onset

[illegible] with [illegible]

## [illegible] Serum [illegible]

[illegible] the effect [illegible] the [illegible] other [illegible] to those [illegible]

[illegible] 28 [illegible] F pulse 108 [illegible] complained of [illegible] 104 [illegible]

[illegible] felt quite [illegible] October 1 [illegible] complaint [illegible] the [illegible] October 2 the [illegible] tablets [illegible]

[illegible] October 3 [illegible] All [illegible] had [illegible]

[illegible] 4,000 [illegible] blood [illegible]

[illegible] October [illegible] per cent [illegible] October 23 [illegible] per cent [illegible] November [illegible] per cent.

[illegible]

In [illegible] solution [illegible] steadily [illegible] and [illegible] of the symptoms. It [illegible] only [illegible] the second course of treatment.

It [illegible] that he developed malaria [illegible] although he had a thorough [illegible] course [illegible].

[illegible] 23 [illegible]. Admitted to hospital [illegible] pain and vomiting. Three days previously he felt [illegible] took two No. 9 pills. [illegible] brought the following day [illegible]. Temperature 101.6° [illegible].

[illegible] 102.6° F. [illegible] there [illegible] palpable [illegible] 200 [illegible].

The patient [illegible] abdominal pain and vomiting, and he also [illegible].

He [illegible] Case 6 [illegible] had also received prophylactic quinine [illegible].

[illegible] showed no malarial parasites and the [illegible].

The [illegible] type of fever [illegible] is con[illegible]. An injection of quinine gr. 10 [illegible] of October 2 at the height of the [illegible] the temperature to normal where [illegible]. At the same time all the symptoms [illegible] disappeared and [illegible]. This rapid [illegible] the case was one of malaria [illegible].

The [illegible] with [illegible] interval between [illegible].

[illegible] 5.9 per cent. October 11 [illegible] October 19, 18 per cent. [illegible] 4.4 per cent. November 12, 6 per cent.

On October 11 [illegible]. Red blood cells 4,940,000; white blood cells 8,[illegible].

On October [illegible]. Red blood cells 4,660,000; haemoglobin 90 per cent.

In this [illegible] began to rise between the first and second [illegible]. It fell quickly during the second course [illegible]. As in the previous case the patient had [illegible] of prophylactic quinine.

In both these [illegible] about one week after the onset of the illness [illegible] 7 [illegible] in Case 6 following treatment and [illegible] of symptoms and without relapse.

In Case 2 the [illegible] when first taken about fourteen days after [illegible], though there was a definite fall following [illegible] course of atebrin. At this stage [illegible] the patient was [illegible] at short notice, so no further observations [illegible].

[illegible] station rate was as high as 28 p[illegible] [illegible] [illegible] [illegible] but while the [illegible] [illegible] [illegible] and two full courses of [illegible] [illegible] although the patient had [illegible] [illegible] that signs or symptom [illegible] [illegible] [illegible] and following the first [illegible] treatment was [illegible] normal.

[illegible] [illegible] [illegible]

[illegible] If this patient [illegible] will [illegible] [illegible]

[illegible] It [illegible] generally [illegible] [illegible] completely [illegible] [illegible] prevent a relapse.

### Summary

In this paper several points are discussed [illegible] The points are summarized as follows:

- (1) [illegible] malaria can [illegible] parasites in the peripheral blood.
- (2) [illegible] parasites [illegible] the illness.
- (3) [illegible] of symptoms may [illegible] In some [illegible] of another [illegible] patient [illegible]
- (4) [illegible]
- (5) [illegible]

W[illegible] [illegible] for permission to publish [illegible]

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## A NOTE ON SUGGESTED ALTERATIONS TO THE NEIL ROBERTSON STRETCHER

### By [illegible] ANDREWS, M.D., R.N.V.R.

We have [illegible] that [illegible] durable though it is, the Neil Robertson stretcher has certain disadvantages.

(1) The handles cut the bearer's hands.

(2) It is too short for tall men. (One very tall [illegible] had to have the chest piece round his abdomen.)

(3) [illegible] in a narrow compa[illegible] [illegible] passing the handles catch on the steps of sliding [illegible] the patient

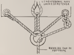
[illegible] or [illegible]

[illegible] These allow [illegible]

[illegible]—Showing rope [illegible] spliced into the [illegible] [illegible] a [illegible] wooden handle

[illegible] Showing part [illegible] to [illegible]

[illegible] (3) Wooden runners [illegible] [illegible] has already been introduced [illegible] The runners make it much easier to handle a patient [illegible] because [illegible] without jolting [illegible] four. Wooden runners [illegible]



[illegible] Showing underside of foot of stretcher

[illegible] bridge over the transoms [illegible] [illegible] The runners reduce [illegible] in certain awkward situations [illegible] although we have fitted wooden [illegible] all our Neil Robertson stretchers [illegible]

[illegible] S B C I O E [illegible]

## DELAYED TRAUMATIC SUBARACHNOID HÆMORRHAGE

By Surgeon [illegible] Commander F. J. COLEMAN, R.N.V.R.

In spite of the [illegible] of Delayed Traumatic [illegible] Hæmorrhage the [illegible] has [illegible]. The following [illegible] reported [illegible] early [illegible] described [illegible] had [illegible] article on this subject [illegible] M.D. [illegible] *Medical* [illegible] immediately following the [illegible].

The patient in [illegible] aged 29 [illegible] was taking part [illegible] A [illegible] knock-out [illegible] of head pain [illegible] twice [illegible] second round. He [illegible] from his [illegible] his routine [illegible] for the following [illegible] he reported to the Sick Bay on account [illegible] small of the back and [illegible] particularly [illegible] temperature was 99 [illegible] pulse rate 72 [illegible] were indicated along the course of the [illegible]. No abnormal signs of the central nervous [illegible] analysis normal. Patient [illegible] admitted to the [illegible].

On June 6, 1940 [illegible] neck [illegible] ache, a temperature of 100 F. and pulse rate [illegible] ous state and very reluctant to converse. [illegible] nerves appeared normal. A positive Kernig's [illegible] and mild neck rigidity. The [illegible] with reinforcement. Lumbar puncture [illegible] under pressure and deeply bloodstained. W[illegible]

On June 7, 1940 the lumbar puncture was repeated [illegible] of fluid removed. The pressure had fallen and the fluid [illegible] cleared. The headache disappeared in a few days but the stiffness of the legs and neck continued for a week. X-ray of skull showed no evidence of bony injury.

Patient resumed duty on July 17, 1940 and has shown no other effects from the injury.

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## SIMULTANEOUS MANIFESTATION OF HERPES ZOSTER AND VARICELLA

By Surgeon Lieutenant-Commander F. J. COLEMAN, R.N.V.R.

Much literature has been [illegible] in recent years on the association between herpes zoster and varicella. The following description refers to a case in which the two conditions [illegible] simultaneously.

The patient, a Chief Petty Officer, aged 30, reported sick on September 26, 1940 complaining of severe neuralgic pains over the left posterior [illegible] triangle.

On September 29 a typical herpetic eruption appeared, severe in type, [illegible] ing the whole of the left side of the neck from occipital ridge to the point of the shoulder. [illegible] the lower anterior limit [illegible] lesions were apparent over the angle of the jaw. The distribution of sensory nerves involved indicated that the disease had affected the posterior root ganglia of the 2nd, 3rd and 4th cervical [illegible]. Morphia was necessary to allay pain.

[illegible] herpes zoster he developed [illegible] This rash was most pro[illegible] the abdomen [illegible] the forehead [illegible] in several crops over three d[illegible] leaving a few typical scars The eruption [illegible] the pain [illegible] by the herpetic condition it was [illegible]

Herpetic eruption was [illegible] and marked scarring On October 20 1940 [illegible] developed which gradually responded to vitamin B [illegible]

Severe post-herpetic neuritis [illegible] with profound melancholia which rendered him temporarily [illegible]

Recalled after ten years [illegible] just completed twelve months of almost continuous [illegible] involved exposure to severe weather and entailed anxiety

These factors were considered [illegible] of herpes zoster

◆

# Correspondence.

## THE NAVAL MEDICAL COMPASSIONATE FUND

TO THE EDITOR OF THE JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE.

SIR,—On relinquishing office as Medical Director-General of the Navy I desire to take this last opportunity of making an appeal on behalf of the Naval Medical Compassionate Fund

An increasing number of subscribers are failing to pay their subscriptions thereby losing the benefits of the Fund and reducing its income

I am well aware of the financial difficulties which confront most of us in these days of war but any day those dependent on us our wives and children may be deprived of the breadwinner and find themselves in very reduced circumstances such cases have occurred already

In addition to the benefits which may accrue to subscribers themselves I would like to point out what a great opportunity this fund represents for affording much needed help to others less fortunate

I cannot believe that by some small personal sacrifice a guinea a year could not be found and so I urge that all back subscriptions should be paid up and that those eligible should become new subscribers

On the termination of my forty years service a generous response to my appeal would be a great source of satisfaction to me

I am Sir

Yours &c

P F NICHOLLS

*Medical Director General*

## THE TREATMENT OF BURNS

TO THE EDITOR OF THE JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE

SIR,—Considerable attention has recently been given to the treatment of burns and controversy has arisen in connection with the use of tannic acid It is however unlikely that anyone will deny that the introduction of the coagulation treatment by Davidson was followed by a fall in the mortality from burns and scalds Other coagulating solutions have since been tried but none have proved entirely satisfactory Might I suggest that the action of salicylsulphonic acid or allied compound may be worthy of investigation?

[illegible] solution [illegible] testing [illegible] Pharm. [illegible] 189 [illegible] results of [illegible] action obt[illegible] It does not [illegible] productive of [illegible]

[illegible]

[illegible]

[illegible]

* * *

## Reviews.

[illegible] of Bones [illegible] IX.—[illegible] Surgeon [illegible] First Edition [illegible]

[illegible]

[illegible]

[illegible]

The chapters [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

H. F. B.

[illegible]

[illegible]

[illegible] death in the

[illegible]

[illegible]

[illegible]

ESSENTIA[illegible]

[illegible]

[illegible]

H. P. [illegible]

◆

# News of the Service.

## HONOURS

### *D.S.O.*

[illegible]

### *Mentioned in Despatches*

[illegible]

[illegible]

[illegible]

### [illegible]

[illegible]

## GILBERT BLANE GOLD MEDAL 1941

[illegible]

## OBITUARY

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] his college. He qualified M.R.C.S. [illegible] M.A., M.B., B.Chir. at Cambridge. [illegible] Hospital, Cambridge, House Surgeon [illegible] Cambridge. He joined the R.N. [illegible] the beginning of the war.

[illegible] M.B., Ch.B. [illegible] Glasgow [illegible] joined the R.N. [illegible]

[illegible] School of [illegible] H.M.S. [illegible]

[illegible]

[illegible]

[illegible]

[illegible] Sheridan [illegible] May [illegible] M.B., Ch.B. [illegible] Edinburgh [illegible] served at R.N.H. [illegible] service was spent [illegible] H.M.S. [illegible] H.M.S. Ark Royal [illegible] May [illegible]

[illegible] was born at [illegible] Essex [illegible] St. George's [illegible] F.R.C.S. [illegible] Hospital [illegible]

[illegible] M.R.C.S., L.R.C.P. [illegible] Hospital [illegible]

[illegible] R.N.V.R. [illegible] was killed [illegible] educated at [illegible] M.B., Ch.B. [illegible] he was appointed to H.M.S. [illegible]

## RETIREMENTS

[illegible] M.R.C.S., L.R.C.P. [illegible]

[illegible] Brown, M.B. [illegible]

[illegible] M.D., B.Ch., D.P.H. [illegible]

[illegible] M.R.C.S., L.R.C.P. [illegible] with rank of Surgeon Captain [illegible] Surgeon Commander [illegible]

[illegible] M.B. [illegible]

[illegible] M.R.C.S., L.R.C.P. [illegible] with rank of Surgeon Captain [illegible]

[illegible] M.R.C.S., L.R.C.P. [illegible]

## PROMOTIONS

[illegible] Commander A. W. North, O.B.E., L.M.S.S.A. [illegible] rank of [illegible] April [illegible]

[illegible] Commander H. A. Clark, M.R.C.S., L.R.C.P. [illegible] February 18, 1941.

[illegible] Lieutenant-Commander H. E. Belcher, M.R.C.S., L.R.C.P. [illegible] Commander April 18, 1941.

Surgeon Lieutenant (acting Surgeon Lieutenant-Commander) [illegible] M.B., M.R.C.S., L.R.C.P. to be Surgeon Lieutenant-Commander [illegible]

Surgeon Lieutenant P. H. Lamb, M.R.C.S., L.R.C.P. [illegible] March 25, 1941.

Surgeon Lieutenant B. R. Alderson, L.R.C.P. & S. [illegible] Commander April [illegible] 1941.

Surgeon Lieutenant I. Lees, M.R.C.S., L.R.C.P., to [illegible] May 23, 1941.

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## WARDMASTERS

### PROMOTIONS

S.B.C.P.O. (Pens.) G. N. Martin to be Temporary [illegible] Wardmaster [illegible] March 31, 1941.

S.B.C.P.O. [illegible] Simpson to be Temporary Acting Wardmaster [illegible] 28, 1941.

S.B.C.P.O. (S.B.R.) J. W. Lowe to be Temporary Acting Wardmaster [illegible] R.N.V.R. March 29, 1941.

S.B.C.P.O. J. T. G. Shilbrook to be Temporary Acting Wardmaster [illegible] 11, 1941.

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## ROYAL NAVAL VOLUNTEER RESERVE

### RETIREMENTS AND RESIGNATIONS

Temporary Surgeon Lieutenant-Commander J. A. Lewis, M.B., B.S. [illegible] temporary commission terminated.

Surgeon Lieutenant A. N. T. Allardice [illegible] appointment and commission terminated (medically unfit) January 11, 1941.

Probationary Temporary Surgeon Lieutenant G. H. S. Be[illegible] appointment terminated (medically unfit) January 30, 1941.

Probationary Temporary Surgeon Lieutenant [illegible] D. Hailey [illegible] appointment and temporary commission terminated February [illegible] 1941.

Probationary Temporary Surgeon Lieutenant H. R. Latta, M.B., Ch.M. [illegible] on transfer to R.C.N.V.R. March 17, 1941.

Temporary Surgeon Lieutenant [illegible] appointment and temporary commission terminated (medically unfit) March 6, 1941.

Probationary Temporary Surgeon Lieutenant R. [illegible] appointment [illegible] May 21, 1941.

### PROMOTIONS

Surgeon Lieutenant-Commander W. [illegible] M.R.C.S., L.R.C.P., to be Acting Surgeon Commander April 21, 1941.

Temporary Surgeon Lieutenant-Commander H. A. Hobbs, M.B., Ch.B. granted acting rank of Temporary Surgeon Commander April [illegible] 1941.

Acting Surgeon Lieutenant-Commander [illegible] Maitland, M.B., Ch.B., F.R.C.S. [illegible] Surgeon Lieutenant-Commander April 25, 1941.

Temporary Acting Surgeon Lieutenant-Commander [illegible] P. Sayers, M.B., B.Ch. [illegible] Temporary Surgeon [illegible] April 26, 1941.

Surgeon Lieutenant R. B. B. Ferrier, M.R.C.S., L.R.C.P. granted acting rank [illegible] Surgeon Lieutenant-Commander April 2, 1941.

Surgeon Lieutenant M. C. Hood, M.R.C.S., L.R.C.P. granted acting rank of Surgeon Lieutenant-Commander January 15, 1941.

Surgeon Lieutenant [illegible] P. S. Kilpatrick, M.R.C.P., L.R.C.P. to be Surgeon Lieutenant-Commander May 11, 1941.

Surgeon Lieutenant B. C. Maybury, M.B., F.R.C.S., L.R.C.P. granted acting rank of Surgeon Lieutenant-Commander February 21, 1941.

Temporary Surgeon Lieutenant H. S. A. Corfield, L.M.S.S.A. granted acting rank of Temporary Surgeon Lieutenant-Commander March 11, 1941.

Temporary [illegible] Lieutenant G. Pratt, M.B., Ch.B., [illegible] Temporary [illegible] Commander, March 12, 1941.

[illegible] M. [illegible] granted [illegible] March 6, 1941.

[illegible] Lieutenant [illegible] R. Bain, M.B., [illegible] Surgeon Lieutenant-Commander, March [illegible].

[illegible] Lieutenant F. Harrison, M.B., [illegible] Lieutenant-Commander, March [illegible].

[illegible] Lieutenant [illegible] A. Smyth, M.B., [illegible] Lieutenant-Commander, March [illegible].

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## QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

### RESIGNATIONS

Nursing Sister Miss M. A. McIlhagga, resigned May 1, 1941.

### PROMOTIONS

Nursing Sister Miss E. M. Wynne-Jones to be Acting Superintending Sister, May 1, [illegible].

### APPOINTMENTS

[illegible] Superintending Sister Miss K. M. Greenwood to R.N. Sick Quarters, [illegible].

Acting Superintending Sister Miss M. F. Cheetham to R.N. Auxiliary Hospital, [illegible].

[illegible] Superintending Sister Miss M. A. S. Walsh to R.N. Auxiliary Hospital, [illegible].

Acting Superintending Sister Miss E. M. Wynne-Jones to R.N. [illegible] Sick Quarters, [illegible].

Nursing Sister Miss M. H. [illegible] to R.N. Hospital, Malta.

Nursing Sister Miss K. N. Chapman to R.N. Hospital, Chatham.

Nursing Sister Miss E. M. L. Wakeling to R.N. Hospital, Plymouth.

Nursing Sister Miss M. E. Griffiths to [illegible] General Hospital, Alexandria.

Nursing Sister Miss S. W. Jones to H.M. Hospital Ship *Ophir*.

Nursing Sister Miss M. I. [illegible] to R.N. Hospital, Haslar.

Nursing Sister Miss N. M. Willoughby to R.N. Auxiliary Hospital, Barrow Gurney.

Nursing Sister Miss M. B. [illegible] to R.N. Hospital, Haslar.

Nursing Sister Miss D. G. [illegible] to R.N. Auxiliary Hospital, [illegible].

Nursing Sister Miss E. I. [illegible] to R.N. Hospital, Haslar.

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## A NAVAL OCCASION

### CLINICAL MEETING IN H.M. HOSPITAL SHIP *VITA*

[illegible] the Editors had the pleasure [illegible] meeting held in a Hospital Ship [illegible] Hospital Ship [illegible].

[illegible] the meeting [illegible] Naval Medical [illegible] the R.A.M.C., R.A.F. Medical Service [illegible] Medical Services.

[illegible] the members of the various [illegible] specimens and [illegible].

[illegible] such a helpful meeting [illegible] and short papers [illegible] cases of [illegible].

[illegible]

[illegible]

◆

## Notice.

[illegible]

[illegible]

[illegible]

◆

## Preparations.

[illegible]

[illegible]

### [illegible]

[illegible] addition of [illegible] the organisms.

[illegible]

[illegible]

[illegible]

## [illegible] TYPHOID VACCINE WITH TETANUS TOXOID (T.A.B.T.)

[illegible] toxoid [illegible]

[illegible]

[illegible]

◆

VOLUME XXVII    OCTOBER, 1941    No. 4

# Journal
of the
# Royal Naval Medical Service.

## Articles.

### A NOTE ON VISCERAL DECOMPRESSION AND THE SUBSEQUENT RECOIL.

By Surgeon Rear-Admiral Sir W. I. de C. WHEELER, M.D., F.R.C.S.I., M.Ch.(Hon.), F.A.C.S.(Hon.)

Ten years ago when investigating a series of cases of obstruction of the urinary outflow, and the results which followed the gradual relief of back pressure, we speculated on how far the general principles involved were applicable to other organs and systems. It was of interest to find that the effects of visceral decompression, and of the subsequent recoil, were fundamentally the same in many branches of surgery and medicine. It became evident that methods of treatment adopted for cases of urinary obstruction were also indicated in cases of intestinal obstruction, [illegible] empyema, cerebral compression, high blood-pressure, glaucoma, [illegible] pregnancy, Caisson disease, and many other conditions. We felt justified in offering the following rule for those who were engaged in the practice of general surgery and medicine. When an organ or a system is suffering directly from pressure effects or indirectly from back pressure, the greater the pressure the more gradual should be its relief. The fatal recoil which may follow rapid decompression in any of the conditions mentioned will be referred to later. It is only possible to touch on the fringe of the subject as the problems concern not only surgeons and physicians but biochemists, physicists, physiologists and others engaged in laboratory investigation. As a general rule an organ or a system will adapt itself to an external stress which is applied gradually. A sudden stress or strain may cause rupture of an organ or irreparable damage to a vital system. If increasing pressure is unrelieved, dissolution of the organs involved is inevitable. If pressure is suddenly relieved there is an equally sudden recoil which often but not always exceeds the original pressure in destructive force. On the other hand if the relief is gradual and not too long delayed, restoration of form and function may be expected. Probably the initial change produced by direct

X

[illegible]

## [illegible]

[illegible] or primary prostatic [illegible] Rapid emptying of the [illegible] congestion of the urinary [illegible] engorgement of the kidneys [illegible] when we remember that the [illegible] through the kidney every few [illegible] like hepatic and cardiac cells have [illegible] some of the kidney [illegible] damaged but recovers after decom- [illegible] there is a residue not involved [illegible] never recover but [illegible] double work. A small [illegible] health. In cases of obstruc- [illegible] catheter and the withdrawal [illegible] especially little to empty [illegible] The damage done [illegible] bladder is immediate. It has been [illegible] even a small quantity (100 c.c.) from [illegible] and circulatory shock. A catheter [illegible] the help of local anesthesia and [illegible] then be adopted. (1) A fine [illegible] needle to pierce the wall of [illegible] bottle at the rate of [illegible] proper draining its length is [illegible] by means of a screw clamp [illegible] for many years. Usually [illegible] hours, however, in bad [illegible] to empty the bladder with [illegible] of residual urine [illegible] failure function preoperative [illegible] while [illegible] show improvement. [illegible] If for some reason [illegible] decompression can be [illegible] Kidd's [illegible] be withdrawn without [illegible] a close-fitting tube passed through the cannula into the bladder [illegible] is clamped [illegible] with a spigot. When the patient [illegible] drainage tube with a glass drip and screw regulating clamp [illegible]. The clamp is adjusted so that the urine drips into the [illegible] bedside at the rate of about 1 drop every two seconds. The [illegible] renal function can be watched as the decompression continues [illegible] bedside. Headache disappears, thirst is relieved, blood pressure falls, the specific gravity of the urine rises, blood urea is reduced, and [illegible] tests become more and more satisfactory. These results [illegible] by haphazard methods. Disappointment usually follows [illegible] methods employed in the operating theatre are relaxed in the [illegible]

## INTESTINAL OBSTRUCTION

There has been some improvement in the mortality [illegible] operation for acute intestinal obstruction. The methods [illegible] in recent years are on more scientific lines, [illegible] winning. The figure remains in the neighbourhood of 40 per cent. [illegible] the last few years it has become recognized that the [illegible] rapid emptying of the [illegible] small intestine is one of the [illegible] death. It is not so long ago when part of the routine [illegible] a large tube through an opening in the bowel [illegible] milk the contents into a bucket [illegible] realized that in many cases [illegible] distended bowel can be accomplished by the passage of a duodenal tube, Ryle's [illegible] by the nose. In the absence of strangulation the [illegible] end with this simple procedure. With the gain of this knowledge [illegible] recent writers have decried the value of enterostomy and [illegible] the advantages of the duodenal tube. Moynihan [illegible] me once about the advantages of the hypodermic [illegible] obstruction. He explained later that he used the [illegible] he slept much better himself when [illegible] drained. A small enterostomy tube is in the same category [illegible] of postoperative safety is increased when it is [illegible] the occasions when it is [illegible]. Intestinal distension [illegible] and the cause can be removed without difficulty, the [illegible] evacuated both by tube *per* [illegible] further interference. On the other hand, there [illegible] operation performed under local or spinal anaesthesia [illegible] the cause, and yet following operation the patient [illegible] the temperature and pulse rate rise, there is [illegible] the blood pressure falls, and [illegible] a lack of preoperative treatment which is responsible [illegible] I have seen many cases [illegible] and [illegible] replacement of [illegible] and chlorides [illegible] drainage [illegible] tube in which [illegible] Experiences [illegible] small [illegible] and [illegible] Drainage [illegible]

Reviewing the subject in [illegible] the highest mortality [illegible] drainage [illegible] These [illegible] possible [illegible] the [illegible] channels and the [illegible] pressure produced [illegible] toxæmia and profound [illegible]. Thus the guiding principle [illegible] the past ten years has been that the [illegible] the abdomen and the longer the [illegible] should be [illegible] removed. The procedure [illegible] anæsthetic is employed. An incision is made over the right [illegible] with the umbilicus [illegible] rapidity [illegible] free fluid is present [illegible] the fluid is seen. The [illegible] A small loop of [illegible] pressure [illegible] clamp. A small [illegible] marked with [illegible] proximal loop. [illegible] The clamp is removed [illegible] of the operation is completed by the Witzel [illegible] method. A [illegible] is quickly made [illegible] which will allow the tube [illegible] kinking. [illegible] through a portion of [illegible] by Charles Mayo. The [illegible] The enterostomy tube is [illegible] clamp. This latter [illegible] in the site of [illegible] gradually the [illegible] of stronger [illegible] with [illegible] difficulty the [illegible] A [illegible] The [illegible] the resulting [illegible] through the [illegible] tube. Apart from the [illegible] drainage [illegible] At [illegible] On [illegible] through the into the [illegible] small intestine was emptied by a pr[illegible] the [illegible] two days. By this time peristaltic power [illegible] returned and drainage continued until the tube was removed.

There are many details in the operative arrangement [illegible] which [illegible] within the scope of this communication. [illegible] American [illegible] a white precipitate [illegible] (Aird)

*Illustrative* [illegible]

Aird continued [illegible] the subject. [illegible] should be felt in draining [illegible] The [illegible] described after [illegible] suggestions [illegible] pression. (*Edin. Med. Journ.* 1936, 43, 3[illegible])

## The [illegible] of the Bile Ducts

Sudden relief of tension from obstruction of the biliary [illegible] intended [illegible] so great a risk as the sudden emptying of the distended [illegible] bladder [illegible] of coils of [illegible]. Nevertheless [illegible] a cessation of liver function may follow rapid decompression. Many years ago Mayo pointed out that the greatly distended gall-bladder [illegible] mechanical devices to provide for gradual decompression. Hepatic deficiency and the so-called hepatic shock [illegible] detailed [illegible] ever some well-established facts. In the first place [illegible] to have a recuperative power of a high order. The regeneration of liver cells and the restoration [illegible] has been studied by Kocher and others. It was then [illegible] the results of the Talma-Morison operation. [illegible] following operation for drainage by the appearance [illegible] comparable to that found in cases of hydronephrosis. It is probably [illegible] from the epithelial lining of the ducts. In severe [illegible] the path of safety appears to be along the line [illegible] intestinal obstruction. The drainage tube should [illegible] only drop by drop [illegible] of intestinal obstruction there may be [illegible] complete resection later [illegible]. In such cases death [illegible] symptoms resembling uremia.

## EMPYEMA

In cases of acute empyema [illegible] the mortality following [illegible] from 40 to 60 per cent. [illegible] usually reduced [illegible] 10 per cent. [illegible] is followed [illegible]. When the [illegible] sudden relief [illegible] may provoke [illegible] and formation [illegible] which [illegible] vessels and important [illegible]. Whether the pressure [illegible] raised and what [illegible] is to aspirate or drain [illegible] of the pus. It is [illegible] to insert [illegible] into the pleural cavity [illegible] Kidd's suprapubic [illegible] the escape of [illegible] a similar purpose. [illegible] by a screw clamp [illegible] suction apparatus [illegible] drainage. When [illegible] tube is introduced [illegible] if possible [illegible] angle of the scapula [illegible] can be extemporized in [illegible] off the finger portion of a flanged [illegible] through the finger portion of the [illegible] by mastisol. The tube and finger stall [illegible] length and passed into the pleural cavity. The flange [illegible] glued to the chest with mastisol and dressings [illegible]. [illegible] air-tight drainage and a negative [illegible] the tube to a suction apparatus.

## [illegible] TENSION

It is well known that lumbar puncture in the presence of brain abscess [illegible]. Only a very small amount of fluid, 2 or 3 c.c., can [illegible]. Lumbar puncture is especially dangerous when [illegible]. In many cases of high tension [illegible] withdrawal of fluid is made manifest by [illegible]. On the other hand, if the needle [illegible] and [illegible] made very [illegible] that [illegible] the impression [illegible] the [illegible] [illegible] the [illegible] [illegible] [illegible] the [illegible] this [illegible] may help [illegible] the [illegible] think that [illegible] the information [illegible] harm. Others [illegible] hours of the [illegible] tension. [illegible] Where [illegible] under [illegible] increase of pressure [illegible] should be [illegible] often [illegible]

## [illegible]

In hospitals [illegible] failure [illegible] should be [illegible] spinal injection [illegible] of high blood pressure. [illegible] record may be [illegible]

## GLAUCOMA

The [illegible] deals with glaucoma [illegible] humour from the anterior chamber. By the [illegible] ocular dilatation [illegible] observed.

## [illegible]

If the formation of fluid [illegible] pressure. If the formation [illegible] and albumin appears in the urine. [illegible] which reveals itself in [illegible] abdominal tension. Obstetric [illegible] necessity for slow [illegible] valvular aperture is provided [illegible] leading to hæmorrhages [illegible] tumour and cannula and the fluid [illegible] first twenty-four hours. [illegible] pressure during childbirth [illegible] however many [illegible] birth maternal death may [illegible] logical lesion. Recently (*British Medical Journal*, [illegible] some such [illegible] were returned at the Royal Academy of Medicine in Ireland. They were classified under the heading of "Obstetric Shock." Death was apparently due to shock in 25 cases, in 18 of which there had been no post-partum haemorrhage and a normal second stage. It is interesting to consider whether death was due in some of these cases to the sudden rising intra-abdominal pressure during pregnancy, followed by a final fall of pressure during labour.

### Caisson Disease (Compressed Air Illness)

The phenomena associated with this condition depend upon return to normal atmospheric pressure after exposure to an atmosphere of compressed air (above 15 lb. per sq. in.). The greater the air pressure and the more rapid the return to normal atmospheric pressure, the greater the intensity of the symptoms. The symptoms include pain in the extremities, nausea, vomiting and abdominal distension, paraplegia, hemiplegia, headache and coma. Sudden death may occur. Caisson disease never occurs if the return to the normal atmospheric pressure be sufficiently slow. Animals can be exposed to very high pressures, short of those causing oxygen poisoning, with impunity, provided they be decompressed slowly enough (Price). A good deal of attention has been given recently to crush injuries, and it has been pointed out by E. R. Lloyd (*British Medical Journal*, April 5, 1941, p. 534) that when the weight is removed there must be a sudden expansion of the limb and a quick suction of blood into the part. This sudden suction must cause numerous slight extravasations of blood and the sharp withdrawal of blood from the brain, leading to collapse. Would it not be possible to have slow decompression in these cases? It is not possible to withdraw the debris slowly, but it would be possible to bandage the part tightly as it becomes exposed. This bandage could then be slowly slackened over a period of time. The suggestion appears to be a good one, but its application would be applicable only under exceptional conditions.

In conclusion, it is obvious that compression and decompression are only one factor in problems which require investigation from many other directions. It appears to be conceded, however, that *cunctando restituit rem* (by delaying he restored) should be our guiding motto when undertaking the treatment.

## TREATMENT OF AIR-RAID CASUALTIES

By Surgeon Lieutenant-Commander J. A. SHEPHERD, M.D., F.R.C.S.Ed., R.N.V.R.

The importance of early publication of experience in reception and treatment of air-raid casualties need not be stressed, and it is apparent that all over the country there must be surgeons who can add to the stock of knowledge acquired in these active times. Many general impressions of treatment have been published, and a few comprehensive and detailed accounts of individual problems. Despite such reports and the growing and widespread practical experience of so many surgeons, little unanimity appears to exist as to the best methods to adopt to save life and reduce disability in these urgent groups of cases.

[illegible]

Many [illegible] casualties. [illegible] major [illegible] suggested [illegible] patients [illegible] are fully equipped [illegible] resuscitation [illegible] patients are [illegible] their condition [illegible] ward in that [illegible] side of the ward [illegible] between [illegible] patients are in bed [illegible] important injuries [illegible] in addition delays [illegible] that patients cannot be [illegible] often damp clothing [illegible] shock cages. It [illegible] ing at this stage [illegible] cases the disturbance [illegible] warmed up the method [illegible] ward must be warm [illegible]

[illegible] bottles, shock cages and special electric blankets [illegible].

Both [illegible] and examination is conducted in [illegible]. One must not be tempted to leave an examination incomplete in one [illegible] and then rush off to another case and begin a further survey. The examining team must move round the ward methodically, completing the examination of each case and ordering the necessary resuscitative [illegible]. This section is thus [illegible] and only by this method can the [illegible] prepare an operation list and generally keep a grip on the situation. The [illegible] can be [illegible] to do the preliminary [illegible] procedures, and few occasions arise when the [illegible] any patient out of turn for immediate [illegible]. [illegible] haemorrhage after admission is rare, and has not been [illegible] serious degree. Occasionally it may [illegible] urgently for a patient in severe pain, but [illegible]. One exception should be made with regard to this rule [illegible] the nursing staff see them [illegible] the [illegible] of feasible at once.

The [illegible] and operating tables must work as a unit [illegible] to prevent overlapping and [illegible] conducted remarkably quickly [illegible] in seeing each case. [illegible] and perhaps it has been [illegible] hospital in a fairly steady [illegible]. When the first ward is full, admission [illegible] examining team moves on after completing [illegible]. By the time the second ward is filled it is [illegible] empty in the first ward—cases [illegible] transfer elsewhere, and a few [illegible] retained permanently in each ward.

A [illegible] the examining team to make a list for operation [illegible] at each stage, and the tables [illegible] the hospital allow, within an [illegible]. The operation list must of course be subject [illegible] early, it will prove very [illegible] period. The relative urgency [illegible] discussed below. [illegible] will determine the time of operation [illegible] between the examining [illegible] officers.

[illegible] casualties [illegible] however minor or [illegible] the whole body must be searched from top [illegible] the back and buttocks. The ease with which [illegible] astonishing. The more one sees [illegible] careful one becomes; mistakes are so frequently [illegible]. With printed forms or stamped anatomical diagrams may [illegible] the best method used so far is to record injuries [illegible] head, arms, chest, abdomen, pelvis [illegible].

### Res[illegible]

The incidence of wound [illegible] The average degree [illegible] that [illegible] The [illegible]

It must never be forgotten that [illegible] in their effect in most of these cases [illegible] in deciding when operation can be accepted [illegible] the condition confronted. It is a frequent observ[illegible] is delayed a patient may reach a period of [illegible] despite all resuscitation measures. [illegible] upon when on the upgrade. This insistence [illegible] be observed in [illegible] injury.

Resuscitative treatment can be divided into [illegible] for moderate degrees of shock and [illegible] ditions. General observations are depended [illegible] the most important are the nature of the injury and [illegible] pressure. It seems doubtful if the laboratory [illegible] intensive blood estimations have very practical [illegible] globin estimations can be done in the ward and [illegible] general clinical picture must take precedence [illegible] reliance be placed on single observations of any kind. [illegible] guide in treatment. [illegible] in relation to [illegible] blood pressure [illegible]

Moderate shock is indicated by [illegible] injury requires only general measures [illegible] comfort of the injured part [illegible] mouth in quantity—[illegible]

Severe shock must be tackled [illegible] methods of heating [illegible] the bed must be [illegible] tively. Intravenous therapy [illegible] blood[1] is given [illegible] reconstituted serum [illegible] is likely (Kirkpatrick, M[illegible] 1941). [illegible] that [illegible] measure [illegible] intensive antishock treatment may [illegible] period. Needless [illegible] often such [illegible] cases. The [illegible] for all and [illegible] apparatus is maintained [illegible] at a speed of forty drops a minute. At this rate no untoward effects are caused and one can [illegible] more blood or plasma at short notice in the [illegible] in cases of relapse.

---

[1] Citrated [illegible]

Severely shocked cases must be given plasma in quantity and given it quickly. It should be possible to run in two pints of plasma in twenty minutes and [illegible] up to six pints at a rather slower rate as the condition improves. [illegible] is required in acutely anaemic patients [illegible] The tendency to give slow drips of blood or plasma is deplored [illegible] the volume of plasma loss from or into the injured [illegible] will exceed the volume transfused. The quantitative aspects [illegible] have recently been considered (Harrison and Picken 1941). It [illegible] no simple clinical method is yet available for determining blood or plasma volume and therefore dosage must follow general rules. On [illegible] limits have been quoted to prevent general [illegible]. These limits must however be exceeded in cases of [illegible] upon muscle wounds where loss of serum continues [illegible]

The [illegible] the best guide to success or otherwise of plasma or blood transfusion. If a rise in systolic pressure occurs with two pints [illegible] unlikely that the patient will recover. Patients have been [illegible] systolic pressure below 50 and have improved at the rate of about 10 points for each pint of plasma or blood given. It is useful to [illegible] a sphygmomanometer on the patient's arm throughout treatment and the ward staff should be trained to take the systolic pressure [illegible]

Although the blood pressure may prove a reliable guide in estimating [illegible] recalled that certain cases admitted early after injury [illegible] for a variable period a high blood pressure. In such cases the [illegible] lead one to suspect that a fall is imminent [illegible] of plasma is given to compensate for the fall [illegible] volume. Such a rise is at the misleading stage of circulatory [illegible] by general vasoconstriction.

Wound shock is [illegible] anoxaemic condition and the administration [illegible] essential part of treatment. The B.L.B. mask has [illegible] and should be used in all severe cases. In [illegible] per cent of these the effect is gloriously beneficial in that [illegible] the pulse strengthens, colour improves and the blotchy [illegible] have been seen to vanish miraculously. If [illegible] the mask it usually means that he does not [illegible] Many patients ask for it to be re-applied if it is removed. [illegible] supply of large oxygen cylinders or better [illegible] of importance. All ward staff should be [illegible] of the mask. The administration of concentrated [illegible] B.L.B. mask [illegible] great value as plasma or blood transfusions [illegible] wound shock.

[illegible] in the treatment of wound shock are the intelligent [illegible] of fractures, especially femurs, the utilization of early [illegible] in the ward, and local blocking of [illegible]

Approximately 70 per cent of the cases given [illegible] the form of plasma or blood transfusions and [illegible] operation. This is considered a low estimate of the [illegible] the severe types of injuries.

### ANALYSIS OF A CONSECUTIVE SERIES OF 245 AIR RAID [illegible]

Owing to local conditions the time of admission [illegible] varied, however, excepting cases requiring extrication [illegible] usually one to three hours. The type of patient [illegible] healthy adult male aged 20 to 50 years. The [illegible] on the mortality rate. All cases admitted after [illegible] been included. The death rates have been [illegible] days from admission. The immediate mortality [illegible]

Although the majority of these casualties [illegible] injuries they can be grouped according to the major [illegible] at the time of the original examination. A [illegible] from the point of view of treatment and [illegible] Table I.

TABLE I

| Group | [illegible] | [illegible] |
|---|---|---|
| 1 Head Injuries | [illegible] | [illegible] |
| Chest Injuries | [illegible] | [illegible] |
| [illegible] Abdominal Injuries | [illegible] | [illegible] |
| [illegible] Compound Fractures | [illegible] | [illegible] |
| Simple Fractures | [illegible] | [illegible] |
| [illegible] [illegible] Splinter Wounds [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] |
| [illegible] Burns | [illegible] | [illegible] |
| [illegible] Eye Injuries | [illegible] | [illegible] |
| [illegible] [illegible] Injuries | [illegible] | [illegible] |
| [illegible] [illegible] | [illegible] | [illegible] |
| Total | [illegible] | [illegible] |

Cases were classified under such headings on the [illegible] admission. Subsequent events did in a few [illegible] in grouping. The different groups are now considered [illegible]

*Group I—Head Injuries.* Total 35 (14 per cent of all [illegible] per cent of group).

Many air raid casualties appear to suffer from [illegible] cussion or more serious cerebral lesion [illegible] from falling on the head or from injury from falling [illegible] appear to have had a definite period of [illegible] a dazed period and although they [illegible] hospital they do not usually have retrograde [illegible] situation in the present series has been [illegible]

Under this heading are included [illegible] skull injuries to minor concussional [illegible] cases are included when the symptoms and [illegible] any other injury present or might be the [illegible] diagnosis of these head injuries may in some [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

*Group 2.* [illegible]

Under [illegible]

[illegible]

[illegible]

Group [illegible] Died [illegible] per cent [illegible]

[illegible] thus holding [illegible] wound [illegible] that the patient is [illegible] than [illegible] single [illegible] However [illegible] they must be [illegible] early if at all [illegible] 1940) While [illegible] operation usually [illegible] visceral injuries [illegible] be expected from [illegible] The shock in [illegible] is very gross and [illegible] and in most cases blood is required rather [illegible] being the main feature of the injury The [illegible] such as compound fractures of the femur [illegible] It is doubtful if operation on limb cases [illegible] early operation) should ever be held up [illegible] patient with severe intraperitoneal injury [illegible] the operating theatre and all died [illegible]

[illegible] small and large intestine [illegible] Blood *per rectum* [illegible] two pints of [illegible] post mortem [illegible] with evidence [illegible] of right hip [illegible] intensive [illegible] post mortem [illegible] region [illegible] Shock very [illegible] three pints of [illegible] however [illegible] small intestine resected for [illegible] inserted [illegible] pints of plasma given but [illegible] admission [illegible]

[illegible] crushed [illegible] of liver from [illegible] within two [illegible] good condition [illegible] liver was found [illegible] had offered [illegible] developed [illegible] was suspected [illegible] There was [illegible] these [illegible] did there [illegible] mortem [illegible] 1940) [illegible] of the [illegible]

*Case 11.*—[illegible] bomb splinter [illegible]

*Case 12.*—[illegible] primary [illegible] after [illegible]

*Case 13.*—[illegible]

*Group 4—Compound F*[illegible] (23 per cent of group)

In this group are in[illegible] injuries of limbs to less [illegible]. A [illegible] large proportion of the [illegible] was proportionally severe. Compound [illegible] a large proportion of the [illegible] early operation required [illegible]ry treatment. Rules for [illegible] with gross muscle damage [illegible] (1939). These are briefly the [illegible] adequate and energetic resuscitation through [illegible] damaged [illegible] and free drainage, avoidance of suture, packing with [illegible] gauze and complete immobilization in plaster of Paris after reduction of fractures. The successful use of reduction apparatus, X-rays and plaster depends on training of all personnel beforehand. In adopting a pattern technique for plastering limbs [illegible] The simple apparatus described by Cohen and [illegible] (1940) has been found suitable for upper limb spicas, and a Watson [illegible] for lower limb spicas. By the pattern method it is possible to apply a hip spica in eight minutes—an important saving of time when many casualties require plaster applications.

The decision to amputate in severe cases may be difficult, and the final [illegible] obviously that of amputation, but the presence of severe shock [illegible] may add greatly to the problem. In severe [illegible] injuries early operation is necessary, as otherwise wound shock and [illegible] may develop (Mitchiner 1936).

Cases [illegible] can be listed under two headings: (1) Those requiring amputation; (2) those with other compound injuries.

### I. [illegible] Amputation

Six [illegible] of the lower limb—[illegible] double amputations [illegible] of upper thigh [illegible]

[illegible] compound [illegible] Operation [illegible]

[illegible]

[illegible] compound injury of [illegible] and the upper

[illegible]

[illegible]

[illegible] of the [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] with satisfactory result [illegible] compound [illegible] Although [illegible]

[illegible] aged 62. Admitted with grossly contaminated compound [illegible] of right [illegible] joint and bomb splinter wound of buttock. Shock [illegible] at first, and although shoulder injury was obviously [illegible] [illegible] was not given until two hours after admission. [illegible] had somewhat deteriorated in spite of two pints of plasma. After operation [illegible] excision of injured parts in upper and lower [illegible] [illegible] satisfactory, but an infection of shoulder joint [illegible] the outcome of which is still in doubt ([illegible] three weeks after operation).

[illegible] compound injury [illegible] elbow joint and B.S. wound [illegible] Satisfactory.

[illegible] 17.—Compound [illegible]. Radial nerve paralysis.

[illegible] 17.—Compound [illegible]

[illegible]—Compound [illegible]

[illegible]—Compound [illegible]

[illegible]—Compound [illegible]

*Group 5.—Simple Fractures.* Total 34 (14 per cent of all cases). Died 0.

This list includes only those cases where simple fractures were the major injury. A large percentage of cases in other groups had incidental simple fractures, sometimes serious, e.g. a case of fracture of femur with a compound fracture of skull. Simple fractures in air raid casualties show no notable [illegible]. Multiple fractures are frequent and X rays may sometimes [illegible] of all four limbs for suspected bony lesions. The incidence of pelvic injury is small and only one pelvic fracture is noted in this list. One patient with a [illegible] pelvic injury required intensive resuscitation.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

*Group 6.—[illegible] of Soft Parts.* Total 36 (14 per cent of all cases). Died [illegible].

[illegible] vary from one [illegible] to an enormous number

Most were due to fragments of bombs as shown by X-ray or operation; a few may have been caused by other metallic fragments, but all showed muscle damage of a gross character. Although the dangers of such injuries have been stressed, there are still many who will take what would appear to be undue risks in the treatment of these cases. Such cases must be operated on early; they must be explored under direct vision and freely opened to allow removal of damaged muscle and foreign bodies. Above all, free drainage must be established and suture avoided whenever possible. Complete plaster immobilization is as essential in these limb injuries as in compound fractures. Any departure from these rules leads to disaster, and the only real complications in this group were seen where the rules were broken. X-ray in these cases is essential before operation, and must be done if circumstances allow. Such localization not only confirms the existence of fragments, but also gives an indication of the scope of the operation which will be required for the adequate excision of the wound track. Examination of these cases must be extremely thorough or entry wounds will be missed.

It has been found that the incidence of nerve lesions in limb injuries of this type is quite high, and a minute spent on a rapid test for anaesthesia in the affected limb is well worth while. It is believed that a few cases developed nerve lesions after operation, possibly from oedema in the region of the injury.

Methods advocated by Trueta (1939) have been followed with success in such cases, except that vaseline gauze has been used throughout in preference to dry gauze.

Bomb splinter wounds of the lower limb are most dangerous, probably because of contamination from the clothing and because of arrangement of fascial and muscle layers. The small penetrating wound of fascia with gross damage of underlying muscle offers a very real danger unless adequately treated.

The first fifteen patients had bomb splinter wounds of either buttock or thigh. The others had less serious wounds of other parts.

The high incidence of buttock and thigh wounds is presumably due to the prominence of these parts when persons throw themselves down for protection.

Complications of a grave nature occurred in Cases 102, 103, 104 and 105. These cases came relatively late to operation and the first three were treated with varying techniques [illegible]. A [illegible] should be [illegible] these cases [illegible] must be rapidly applied. Plasma loss in these cases [illegible] and it has been suggested that [illegible] should be applied [illegible] to prevent [illegible] plasma being lost from the wound (Huffman 1941). There are objections to this procedure [illegible] the limb, and it is thought that rapid transfusion of plasma will control most cases provided operation is done soon.

The less serious bomb splinter wounds of other parts received the same treatment and healed [illegible] in all cases. No serious complications occurred in this group, but four more [illegible] for operation [illegible] three lower leg injuries.

*Case 102.*—Admitted with severe shock following bomb splinter wound of posterior thigh. Resuscitated with three pints of plasma. Operation thirteen hours after injury limited to drainage of wound and [illegible]. Sciatic nerve almost completely severed. A [illegible] gas gangrene [illegible]

[illegible] posterior thigh muscles with extreme toxaemia [illegible] with [illegible] and early immobilization in closed plaster [illegible] was gradually [illegible] and subsequent debridement of [illegible] muscle masses left [illegible] wound.

*Case 103.*—[illegible] injury [illegible] buttock. [illegible] partial excision was followed by development of severe [illegible] gas gangrene infection. [illegible] treated [illegible] as 102 and recovered despite the [illegible] of the condition.

*Case 104.*—Bomb splinter wounds of thigh and [illegible] partial excision were followed by severe streptococcal infection [illegible] healing obtained after a period in [illegible] plasters.

*Case 105.*—Admitted [illegible] shock following [illegible] bomb splinter wound of posterior thigh and buttock and extending up [illegible] side. Resuscitation with [illegible] pints of plasma resulted in [illegible] condition in four hours but [illegible] condition further. [illegible] blood pressure [illegible] again in two hours and [illegible] hours after injury when operation was attempted the [illegible] showed gangrenous [illegible] sciatic nerve severed [illegible] open flaps left. Patient [illegible] pints of fresh blood during the [illegible] occurred. Condition became [illegible] satisfactory but [illegible] was retarded by infection of the [illegible].

*Cases 106 to 116.*—Bomb splinter wounds of [illegible] and thigh [illegible] satisfactorily by early operation and the usual technique [illegible] plaster.

*Cases 117 to 121.*—Bomb splinter wounds of [illegible] treated with satisfactory results by usual technique.

*Cases 122 to 137.*—Bomb splinter wounds [illegible] multiple [illegible] than legs. All treated by usual technique [illegible] sutured. Upper limb lesions enclosed in plaster. [illegible] prior to discharge or transfer.

*Group 7.—Lacerations of Soft Tissue.* Total 7 (3 per cent. of all cases). Died 0.

These are cases with extensive lacerations of muscle, other than bomb splinter wounds. They are mostly due to glass and do not include minor lacerations from this cause which are so common in these casualties. The condition of extreme progressive anaemia with small multiple small glass splinter wounds (Cope, 1941) has not been seen. Operation in these cases is not so urgent as in bomb splinter injuries and primary suture may be done inside twelve hours.

*Case 138.*—Glass cut of thigh and knee, severing patella tendon completely. Early operation with primary suture, with satisfactory result.

*Cases 139 to 145.*—Group of miscellaneous lacerations, mostly due to glass. No complications in these cases.

*Group 8.—Burns.* Total 8 (6 per cent. of all cases). Died 0.

Burns in air raids appear to result mainly from incidental fires, contact with incendiary bombs, and more rarely from actual bomb flash. In this cases of eight [illegible] hospital only one [illegible] results in this. Results [illegible] cases with plasma [illegible] and oxygen will save lives [illegible] in the sand. After [illegible] burns have with [illegible] those of certain areas [illegible] fully with tannic acid 5 per cent and silver nitrate 10 per cent. [illegible] a rapid coagulum—an important point when many [illegible]. Where spraying methods have to be continued in the [illegible] that infection is much more likely. After treatment [illegible] previously described (Cohen 1940). Certain areas [illegible] eyelids, lips, genitalia, ears and the fingers. Burns of [illegible] treated on light plaster splints in the position of function [illegible] wax applied on strips of gauze (Colbourne 1940). This [illegible] excellent healing and good functional result when the [illegible] not too severe. It is firmly believed that the bad results [illegible] methods of the fingers are due to initial damage by the burn. [illegible] wax method is however much more comfortable [illegible] applied with success to other areas.

Coagulation methods would be given up with [illegible] plasma loss is anticipated. It should be noted that the [illegible] of 25 per cent of the body area spells danger [illegible]. Many [illegible] are caused by [illegible] higher [illegible] burns. Where the additional factors of [illegible] a much smaller area [illegible]. It is [illegible] therefore [illegible]. Cases of severe burns [illegible] plasma [illegible] rapidly. [illegible] experience [illegible] is preferable to plasma [illegible] (Black 1940) [illegible] the plasma.

*Case 18.*—Extensive burns of face, chest and [illegible] splinter wound of thigh [illegible] pints of plasma.

*Cases 11 [illegible] 153.*—Mild [illegible] burns of face [illegible]

*Group 9—Eye Injuries.* Total 4 (2 per cent of all cases). Died 1 (25 per cent of group)

Four cases of eye injury are listed, of which one required removal of the eye for perforating wounds with small metallic splinters. One case died under anaesthesia. No cause of death could definitely be assigned.

Several other patients had other major injuries [illegible] should be examined carefully [illegible]

*Case 153.*—Multiple burns and foreign body.

*Case 1[illegible].*—Perforating wound of [illegible] with small metallic splinters [illegible] removal of eye. Died under anaesthetic [illegible]. No post mortem.

*Case 1[illegible]6.*—Small metallic splinter in eyeball. Surgical removal, which was performed satisfactorily.

*Case 157.*—Corneal abrasions.

*Group 10—Minor Injuries* Cases 15[illegible] to 229 Total 71 (29 per cent of all cases) Died 0

This group includes patients with slight shock, sprains, minor lacerations and bruises. All required careful examination to exclude more serious injury; many required X rays to exclude bony lesions. Eleven required minor operative procedures.

*Group 11—Unclassified* Total 16 (7 per cent of all cases) Died 4 (25 per cent of group)

Under this heading are included three cases of severe multiple injuries—the major lesion being in doubt; crush injuries; "blast" injuries; and a few miscellaneous cases.

*Crush Injuries.*—Considerable data have been recorded already on the well recognized syndrome of crush lesions of limbs and renal failure. Two definite cases were found in the series, and it is hoped that an independent communication will be made on them. Therapy is still in doubt and conflicting statements have been made regarding treatment.

*Blast Lesions.*—These injuries are frequent but at times difficult to detect. It has been suggested that early chest X rays should be done in doubtful cases [illegible]. Injury to the ear drums, as found by examination [illegible] or on examination of the drum, may at least suggest the likelihood of lung lesions from blast.

*Cases 230 to 232.*—Three cases of multiple injuries to trunk and limbs, all of [illegible]. All patients died within an hour of admission, and their condition was such that no adequate resuscitation was attempted. No post mortem.

*Case 233.*—Steel helmeted man. Admitted with no obvious injury but [illegible]. Dyspnoea was very marked and cardiac condition poor. [illegible] and haemoptysis four hours after admission, suggesting blast lesion of lungs. Died eighteen hours [illegible] presumably [illegible] with blast lung. No post mortem.

*Case 234.*—Massive collapse of left lung, believed to be blast effect [illegible].

*Cases 235 and 236.*—Two cases of blast lung, as shown by X rays. Recovery.

*Cases 237 and 238.*—Two cases of crush syndrome of lower limbs. Both [illegible] it is hoped that [illegible] will be [illegible] on these cases at a later date.

*Case 239.*—This patient was pinned under debris for three and a half hours [illegible] over his left leg and pelvis. He was observed through [illegible] and [illegible] demanded that he should be [illegible] throughout. After extrication no injury was [illegible] perfectly [illegible]. He subsequently [illegible] associated with a previously undetected [illegible] fracture.

*Cases 240 and 241.*—Two patients who were buried for four hours under [illegible] in these cases with careful [illegible] serious crush effects.

*Case 242.*—This patient had [illegible] associated with fracture of pelvis and [illegible]. Operation was not required as [illegible] condition improved.

*Cases 243 and 244.*—Two cases of [illegible] wounds of lumbar spine with [illegible]. One case required [illegible] exploration for removal of fragments, but spinal cord was [illegible]. The other case had only removal of

[illegible]

Case 243.— [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

## Mortality

[illegible] blast effects [illegible] (Case 233).

[illegible] high. One is [illegible] (Case 48) [illegible] all three limbs [illegible] The remaining two cases [illegible] amputation—

succumbed about two days after [illegible] the immediate shock. In both cases [illegible] have precipitated death. One had [illegible] fusion of fresh blood and died shortly [illegible] donor and recipient (Group III) [illegible] satisfactory. The other died [illegible] body and thus could not be [illegible] transfusions of plasma or saline.

It is apparent then that the [illegible] and it is regretted that [illegible] examinations being done except in [illegible]

Until some legislation [illegible] can be done on such [illegible] shall solve the problems of [illegible] numerous questions.

The compilation of this paper would [illegible] advice and team work of [illegible] Thanks are due especially to [illegible] cases and who have granted permission [illegible]

Finally it seems appropriate [illegible] country for his notable contribution [illegible] and casualties.

## [illegible]

[illegible]
BLACK, D. A. K. (1940). [illegible] 2 [illegible]
COHEN, S. M. [illegible] 2 [illegible]
COHEN, S. M. [illegible]
COLLIER, J. (1940). [illegible]
COPE, Z. (1940). [illegible]
DOUGLAS, D. M. and CARR, [illegible] 2 [illegible]
HARRISON, G. A. and [illegible]
HOFFMAN, S. J. (1941). [illegible]
JOLLY, D. W. (1940). [illegible]
KEKWICK, A., MARRIOTT, H. L., MAYCOCK, W. [illegible]
1, 100.
ROBERTS, LAMBERT (1941). [illegible]
TRUETA, J. (1940). The [illegible]

## PYLOROSPASM IN GASTRO-DUODENAL [illegible]

By SURGEON LIEUTENANT-COMMANDER T. COLVER, [illegible]

PYLOROSPASM is a common and familiar complication [illegible] duodenal disease. It probably occurs at some stage in the [illegible] peptic ulceration (Hurst, 1934) and as its presence in [illegible] which worsens prognosis (see below) and modifies treatment [illegible] is of some importance.

The term pylorospasm implies an abnormal [illegible] and also a prolongation of the sphincter's contractile phase. [illegible] factors results in delayed emptying of the stomach [illegible] which is of [illegible] in that it is [illegible] constit[illegible] to verify his diagnosis [illegible] that painful [illegible] in the absence [illegible] Such [illegible] produce [illegible] in [illegible]

Pylorospasm [illegible] presenting difficulties [illegible] the patient [illegible] food and fluid being vomited in the [illegible] and [illegible]. Here [illegible] vomiting [illegible] and [illegible] dehydration [illegible]. The [illegible] may last [illegible] even weeks and [illegible] period the patient suffers [illegible]. Particularly does [illegible] immediately after the [illegible]. Finally however there is [illegible] which betrays the spasmodic nature of the condition [illegible] surprised by the rapid disappearance of symptoms which may even occur overnight. Pain abates, the frequent [illegible] dehydration is quickly overcome and there ensues a long [illegible] period during which the weight slowly returns to normal in the [illegible] 2 lb. a week. Sometimes weights of up to 20 lb. [illegible] (Case History 4) and not less than 12 lb. was gained in [illegible] types of this series. It should be mentioned that in the [illegible] of the symptoms any doubt as to their cause may be dispelled by [illegible] X-ray which reveals that quite a quarter of the meal is retained in the [illegible] at the end of five hours, a finding which [illegible] distinguish [illegible] from the lesser degrees of pylorospasm.

These gross examples of pylorospasm are however in the minority and the [illegible] and its symptoms by no means pathognomonic. [illegible] suspect the presence of pylorospasm when [illegible] associated with vomiting when the food [illegible] is replaced by food aggravation and when the patient [illegible] the character of his epigastric discomfort has [illegible] more colicky type. Moreover [illegible] symptoms especially when associated with a [illegible] the result of pylorospasm. However such a [illegible] is corroborated by the demonstration of delayed [illegible] emptying. The gross cases show marked barium [illegible] at the end of five hours which disappears during treatment the [illegible]. In the milder cases however there is no considerable [illegible] at five hours and the less obvious delay in emptying can only be demonstrated by making actual measurements of emptying rate. [illegible] tests the radiological method has [illegible] and [illegible] has been made to the gruel emptying [illegible] the use of X-ray [illegible] being reserved for diagnosis, the exclusion [illegible] emptying rate determinations) and [illegible] of the lesser degrees of delayed emptying.

The gruel emptying [illegible] carried out in the usual hospital manner [illegible] taken to standardize conditions and to exclude as far as possible [illegible] and nervous apprehension. The starch testing [illegible] two observers so that in the reading of end point a slight difference in [illegible] only the basic observation [illegible] at the usual two and a half [illegible] hours, if no end point had [illegible]

## STOMACH EMPTYING RATE [illegible] LIMIT [illegible]

In deciding whether a certain emp[illegible] customed to adopt some such arbitrary [illegible] any emptying time longer than three [illegible] result is within normal limits. Either [illegible] a three hour emptying time in the [illegible] (fast emptying) stomach implies [illegible] within normal limits for the man who [illegible] ing) type of stomach. A three hour emptying [illegible] found both when pylorospasm has [illegible] normal emptying occurs in an otherwise [illegible] emptying time however close up [illegible] time of the man who exhibits pylorospasm [illegible] until the normal basal emptying [illegible] region of one and a half hours) when [illegible] in the healthy subject whose basal emptying [illegible] even when the basal emptying rate [illegible] rate at the height of pylorospasm symptoms [illegible] difference is significantly great. [illegible] illness which contrasts [illegible] diagnosis of initial pylorospasm. For [illegible] found in healthy subjects under standard [illegible] variations under the conditions of the emp[illegible] and to this end repeated measurements [illegible] series of twenty-five healthy subjects. [illegible] the ratio R1—R2/R2 (where R1 = longest emp[illegible] shortest emptying time recorded) never exceeded [illegible] words under standard conditions the diagnosis [illegible] corroboration when the emptying time during [illegible] quarters as long again as the basal emptying [illegible]

## THE INCIDENCE OF PYLOROSPASM IN 100 C[illegible] GASTRIC WARDS OF A NAVAL H[illegible]

*Clinical Material.*—As a sample of the [illegible] observation in the gastric wards of a Naval [illegible] consecutive admissions to such a unit [illegible] classification of these patients is shown. In Group [illegible] who exhibited conclusive evidence during [illegible] disease and the group included both [illegible] craters (whether by radioscopy or gastroscopy [illegible] to typical recurrent symptoms suffered [illegible] during observation. In Group II were placed those [illegible] not [illegible] evidence of active disease, but who exhibited presumptive [illegible] they had on one or more occasions suffered such disease. They [illegible] the more suggestive histories, compatible acid curves, and such [illegible] of disease as irregular duodenal contours. A proportion [illegible] were clearly in remission by the time they were admitted [illegible] however, in others there was suggestive, though inconclusive, [illegible] evidence which included such features as tenderness [illegible] responses in respect of symptoms, weight, radiological [illegible] Finally there was the third group in which were [illegible] patients whose dyspepsia was regarded as of a minor charac[illegible] the histories of these patients were not of the ulcer pattern [illegible] Clinical evidence of activity was not [illegible] were negative in character.

[illegible] approximately half of the patients the evidence [illegible] organic disease (the occasional cases of neoplasm [illegible] appendicitis, &c., have been excluded from this series) [illegible] these conclusive evidence of activity was forth[illegible]

*The Incidence of Pylorospasm.*—The incidence of pylorospasm in this [illegible] is shown in Table I. In the complete series of 100 [illegible] cases. With one exception all these occurred [illegible] exhibited evidence of organic disease, and the [illegible] among the patients who showed definite [illegible] the time of examination than among those in [illegible] evidence was not forthcoming.

TABLE I

| | Number of cases | | Number of cases of pylorospasm |
|---|---|---|---|
| [illegible] | 12 | 100 | 6 |
| [illegible] | [illegible] | | 6 |
| [illegible] | 54 | | 1 |
| [illegible] | [illegible] | | 1 |

*Pylorospasm as Related to the Clinical Significance of Pylorospasm.*—[illegible] of pylorospasm in healthy people and in patients who suffer from [illegible] The results of two such sets of observations [illegible] that pylorospasm occurs in the majority [illegible] evidence of active ulceration and practically [illegible] conditions. The logical [illegible] that the occurrence of pylorospasm [illegible] symptoms of peptic disease constitutes strong [illegible] symptoms originate in an active organic [illegible] that lesions of other abdominal viscera [illegible] may induce reflex pylorospasm [illegible] Appendicular symptoms in association [illegible] lesion just as peptic ulcer [illegible] pylorospasm point to active peptic ulceration [illegible] that in dyspepsia the occurrence of

[illegible]

[illegible] suffered [illegible]

*Treatment* [illegible] is that of [illegible] tion. In the [illegible] treatment [illegible] hospital [illegible] by a [illegible] eggs, jellies and [illegible] feeds [illegible] quantities [illegible] latter diet [illegible] patients [illegible] diminished and finally [illegible] being [illegible] self-adjusting [illegible] who [illegible] (twelve weeks [illegible] gained 20 lb. [illegible] admission to hospital [illegible] hand [illegible] before [illegible] ment. The [illegible] is appreciated [illegible] 14 lb. during [illegible] spasm [illegible] of the series.

(2) Gas. Pylorospasm [illegible] with its copious vomiting [illegible]

portant measure, the value of which is fully appreciated by the patient. During the hours of severe pain the washout often brings prompt relief. Thus Case 5 had suffered almost continual severe pain for seven days before admission. On admission he looked ill and dehydrated. He was unable to sleep during the first night and reported continued severe pain until the time of his test meal. On the following day when the resting juice was removed prior to the test meal it was found to contain much food, and the stomach was accordingly washed out. It was found that the contents and washings were offensive, gritty and sludgy in consistence. The test meal was then carried out, and during the afternoon the patient reported that he now felt comfortable for the first time for over a week. On the following night he slept well without a hypnotic and severe pain was never again reported. Washouts were continued for seven days and the patient proceeded to gain 16 lb during the next nine weeks. The washouts in these grosser cases of pylorospasm have usually been carried out once or twice a day and have been continued as long as the acute symptoms have persisted. Not infrequently patients have requested additional washouts when pain has been severe. The mechanism by which they bring relief is not clear, though it is probable that the stagnating stomach contents induce additional degrees of spasm and pain which are removed when the stomach is emptied.

The question of diet in these patients is easily settled. Solid food provokes pain and vomiting and is accordingly avoided, a milk diet being provided until the acute symptoms subside.

(3) Refractory Pylorospasm. In two cases of this series (Case Histories 1 and 5) pylorospasm persisted in spite of treatment for several weeks. In neither case was it possible at any period to grade the diet up to normal requirements without provoking vomiting, and it became clear that only by operation could the patients be relieved of their gross disability. How long medical treatment should be continued before a case is regarded as an example of refractory spasm varies. As long as the weight is steadily climbing medical treatment is warranted in cases of prolonged pylorospasm (Case History 4), even though the condition lasts for many weeks, and in most cases evidence of spasm will have disappeared before the weight gain is completed. If, however, two weeks of medical treatment do not result in an amelioration of symptoms or a gain in weight, operation must be considered during the recurrence of gross pylorospasm (Case History 1).

(4) Pylorospasm Superadded to Cicatricial Pyloric Stenosis. One such case occurred in the present series and gastroenterostomy was performed.

*Drugs*.—In all these cases of pylorospasm alkalis (magnesium trisilicate) and belladonna were administered as long as pain or vomiting were troublesome. Both drugs have been discontinued as soon as the patients have been well on the way toward recovery. In the cases of gross pylorospasm the administration of alkalis has been cautious.

### Vomiting as a Symptom in Pylorospasm

When a patient who gives a convincing history indicating recurrent ulceration exhibits definite food vomiting, pylorospasm can practically always be demonstrated. This holds even when the vomiting only occurs every day or so, and has repeatedly been confirmed in the present series.

[illegible] British Army in France (No[illegible]) [illegible] it was the [illegible] [illegible]. Subjects who for years had [illegible] unaccompanied by [illegible] [illegible]. The [illegible] of active [illegible] [illegible] pylorospasm. The [illegible] recurrent dyspepsia. The Army [illegible] the Navy] had in many cases [illegible]. They had perhaps experienced [illegible] but had learnt [illegible] [illegible] of sensible regimes and [illegible] [illegible] walk is extremely light [illegible] to be reversible in the early stages [illegible] [illegible] was then impossible [illegible]. The reversible stages [illegible] [illegible] spasm [illegible] [illegible] [illegible] [illegible].

## [illegible]

In [illegible] changes [illegible] of the [illegible]. [illegible] usually take the [illegible] [illegible] History [illegible] [illegible] gastritis [illegible] in one case [illegible] the present series the [illegible] [illegible] profuse [illegible] haematemeses ([illegible]). The [illegible] suggested that secondary gastr[illegible] [illegible] usually held responsible for the [illegible] pyloro[illegible] [illegible]. The mechanism by which these [illegible] be quite clear [illegible] [illegible] complicate [illegible] pyloric stenosis [illegible]. [illegible] the offensive [illegible] [illegible] surprising that there should be [illegible] of the stomach wall [illegible] [illegible] [illegible] the feeling of [illegible] [illegible] familiar and [illegible] complications [illegible] [illegible] and alkalis.

*[illegible] History.*—[illegible]

[illegible]

[illegible] remaining in the stomach at five hours. The [illegible] persistent irregular deformity of the duodenal cap. [illegible] of maximum tenderness, and was regarded as [illegible] test revealed a high climbing hyper[illegible] and the [illegible] was found to be greater than five hours.

During the following six weeks symptoms abated [illegible]. Vomiting ceased. [illegible] weight were gained, and the gastric emptying time [illegible] four hours and [illegible] half hour. [illegible]

[illegible]

During the four months prior to his [illegible]

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## SOME ASPECTS OF WOUND SHOCK WITH EXPERIENCES IN TREATMENT

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The proper treatment of any bodily disorder is necessarily based upon an understanding of the fundamental changes responsible. From the clinical aspect the diagnosis of the disorder is made by correlating signs and symptoms. Many of these signs may be common to different pathological conditions and it is only when one or more are pathognomonic that a diagnosis can be made by rule of thumb. Most other states demand judgment and ex [illegible] also some require elaborate complementary scientific investigation. There can be no better example of these generalizations than the [illegible] conditions which give rise to the signs and symptoms found in what is commonly called "shock." Shock is a loose term which describes the state of a person exhibiting lowered vitality and circulatory disturbance following mental or bodily injury, including the deliberate procedure of surgical operation. The severity ranges from a mere faint which [illegible] to gross circulatory failure which culminates in irreversible [illegible]. The classical symptoms and signs are a lowered blood pressure, a pulse that is generally fast and of poor volume, pallor and coldness especially of the lips and nails, sweating, and coldness. In cases of injury the mental state is often surprisingly clear and alert whilst pain may be very little in proportion to the amount of tissue damage. Vomiting is common. When the blood pressure is persistently low later signs include reduction in urinary output followed by anuria. This battery of symptoms, sometimes trivial, sometimes serious, obviously needs to be carefully analysed in relation to cause if proper treatment is to be prescribed. Too often the condition of "shock" is accepted as a single clinical entity and the treatment given is as vague and unscientific as the diagnosis.

War has brought the whole subject of shock very much to the fore, and there has been much experience to assess and expand the valuable observations made in the war of 1914-1918. There has been opportunity to study the reactions of the human body to various combinations of injury, fear, exposure, haemorrhage, burns, crushing, multiple fractures, head wounds and other features such as delay between injury and treatment. These observations are made on an unrestricted age group, for casualties now include the very old and the very young and not simply the fit young Service man, and need to be carefully classified into groups in order that the clinician may be presented with descriptions sufficiently clear to enable him to visualize the fundamental cause of the symptoms in each individual case. New causes of circulatory collapse in the injured as well as factors which may modify the clinical picture will doubtless be discovered when the experimental and clinical work of the war are analysed and correlated. In the meanwhile the following description gives some of the known causes of circulatory collapse in the injured. The voluminous literature of the subject is briefly reviewed later.

## CAUSES OF CIRCULATORY COLLAPSE IN THE INJURED

### (A) *Blood-volume Reduction*

This is undoubtedly the commonest cause of circulatory collapse following upon injury and is the group in which transfusion of the appropriate fluid is usually effective. For this reason transfusion may be regarded as the most important single measure for resuscitation work. Reduction in blood volume causes circulatory embarrassment because cardiac filling is imperfect. Consequently cardiac output as well as the efficiency of the driving force are greatly reduced. This leads to imperfect nutrition, particularly of the peripheral parts, and is a progressive state in which metabolism falls to a low ebb and vital tissues finally become damaged beyond recovery. Thus in the later phases of blood-volume reduction the peripheral capillaries may [illegible] that plasma leaks from the circulation into the tissue spaces.

Blood volume reduction may arise in a number of ways, the immediate [illegible] according to the manner in which the reduction is brought about.

1. *Haemorrhage.*—A quick haemorrhage means a loss of all elements of the blood. [illegible] an acute loss not exceeding a pint is immaterial [illegible] it is a geometrically progressive embarrassment [illegible]. [illegible] it has been found that life can still continue [illegible] as much as six or seven pints are lost. And [illegible] replacement can be made without delay many lives [illegible]. The physiological reactions following upon haemorrhage are [illegible] contraction in an effort to maintain a reasonable [illegible] of what blood remains, and secondly [illegible] the tissues in an attempt to restore blood volume. [illegible] and urgent requirement than the making up [illegible]. The symptoms of shock disappear in those who [illegible] sufficiently long for blood volume to be efficiently [illegible] occurs in those whose blood volume is restored by trans[illegible]. [illegible] whose blood volume remains reduced and whose circula[illegible] operate in an embarrassed manner progress to [illegible] capillary damage and they begin once again to lose [illegible] (plasma) this time into the tissue spaces. In these the blood [illegible] and this increased viscosity adds to the difficulties of [illegible]. Such states arise under the conditions of delayed evacuation [illegible] rather than in air raid casualties who usually reach hospital [illegible] time of wounding.

2. *Plasma Loss.*—(a) At the site of injury. Wherever there is tissue [illegible] exudation of plasma into the injured area. This can be [illegible] injured limb when a tourniquet is removed and is shown [illegible] of the tissues in the injured area quite apart from [illegible] itself. And so the blood lost in an acute haemorrhage may not [illegible] of the fluid lost to the circulation long after the haemo[illegible] plasma exudation into the wounded area may continue [illegible] serious aspect of blood volume reduction because of [illegible] blood elements.

(b) [illegible] injuries. Considerable plasma loss from the circulation occurs [illegible] of the body is compressed or crushed for long periods. This [illegible] there is no rupture of blood vessels or severe tissue [illegible]. The exact mechanism of this phenomenon [illegible] plasma into the crushed tissues accompanied by the [illegible] is not completely understood. The plasma loss [illegible] a vast reduction of blood volume. The early [illegible] associated with a falling blood pressure and other [illegible] although in the late phases and sometimes in the early [illegible] blood pressure which may possibly be a symptom [illegible] developing [illegible] renal incompetence.

(c) Burns. There is always an exudation of plasma into a burned area and this loss provides the purest example of blood volume reduction due through to plasma loss. The amount lost may be very large and so cause a great increase in blood viscosity from haemoconcentration. There appear then to be other factors tentatively suggested to be toxic substances derived from the destroyed tissue which contribute greatly to the symptoms of circulatory collapse and which may not come into operation until a day or two after receiving the burn.

*(d)* Gross dehydration. Body water is maintained at a constant level by a balance between fluid intake and output. Should intake cease, output nevertheless continues. The process in a person dying of thirst is that he first excretes tissue fluid and when this source is exhausted he begins to lose fluid even from the circulation itself. The last stages of dehydration therefore give rise to blood volume reduction accompanied by haemoconcentration which produces symptoms of circulatory collapse. It will be appreciated that under battle conditions severe grades of dehydration may occur. Men are often potentially dehydrated before they are even wounded. They may be in places where water is difficult to obtain, whilst exertion and sweating increase the fluid loss. When wounded the reaction to blood loss is to absorb tissue fluid into the circulation. And if no fluid by mouth is available advanced degrees of dehydration may occur, becoming more and more pronounced the longer the delay between wounding and receiving treatment. It is for this reason that the giving of fluid by the mouth is such an important part of the treatment of battle casualties. Not only does such fluid overcome dehydration but also helps the patient to restore his own blood volume efficiently and quickly.

### (B) *Psychogenic and Neurogenic*

Emotion, fear and pain are known to influence cardiac action and to produce fainting or syncope, brief or prolonged. The patient may exhibit alarming signs of cardiac embarrassment including a low blood pressure and the peripheral signs of sweating, pallor, cyanosis and coldness. This may occur with or without definite bodily injury. The state in its pure form usually responds to conservative measures which include relief of pain, reassurance, warming up and the administration of hot stimulating drinks. When it occurs in combination with definite injury the amount of collapse due to nervous influence cannot be assessed in advance; it is only revealed when conservative treatment alone produces an obvious improvement in condition. No casualty in whom the nature of the wounds is such that he obviously falls into the first category (blood volume reduction) should be treated for prolonged periods with conservative measures only in the hope of achieving a result. It is therefore important to examine all patients thoroughly in order to be aware of the nature and extent of the injuries before attributing their symptoms to neurogenic causes alone.

### (C) *Toxemia*

During the war 1914-1918 it was found that casualties admitted with an established gas gangrene infection often exhibited circulatory embarrassment or collapse. The removal of an infected limb would sometimes cause such symptoms to disappear. This again is a feature more commonly found in battle casualties than in those quickly evacuated from an air raid. The surgical treatment of infected cases should not therefore be delayed longer than possible.

### (D) *Fat Embolism*

This phenomenon, which has been encountered as the result of the severe bony injuries of total war, is associated with general collapse, apathetic [illegible] confused mental state and sweating. Unlike the conditions described above, the blood pressure is usually well maintained. But unless the important observation is made, the clinical state is not readily differentiated from that of other causes of collapse. The importance of bearing fat embolism in mind is that it is usually made worse by transfusion.

## FACTORS WHICH MAY CONTRIBUTE TO CIRCULATORY COLLAPSE IN THE INJURED

It may be accepted that blood volume reduction, whether from blood loss or plasma loss or both, is by far the commonest cause of progressive circulatory embarrassment in the injured.

Nevertheless there are a number of factors, which are briefly summarized below, which are known to have or thought to have a bearing on the problem of shock. Some of these operate as part of the vicious circle of progressive circulatory collapse, while others are believed to come into play in special types of injury.

*Anoxia.*—One of the symptoms of an embarrassed circulation is cyanosis, and anoxia may therefore be regarded as part of the vicious circle of events that finally leads to death. Though anoxia does not cause shock, its relief may considerably assist recovery. It is known also that an unskilfully administered anaesthetic may rapidly cause circulatory collapse. There is no place for gas and oxygen anaesthesia unless it is skilfully given.

*Pain.*—This factor undoubtedly contributes to circulatory collapse, and [illegible] bombardment of the nervous system by nociceptive impulses is regarded by some as one of the fundamental factors in producing a state of shock. In practice the prevention of this pain factor is accomplished by the administration of morphine and occasionally by judicious local anaesthesia. General anaesthesia is considered to be dangerous.

*Cold.*—Continuous exposure to cold has long been recognized as an adverse factor. Hence the importance of keeping the patient warm, but at the same time overheating is deleterious and must be avoided.

*Adrenal Factors.*—Certain experimental results indicate that adrenal cortical extracts may be useful in the treatment of shock, but the evidence is by no means convincing, and in the present state of knowledge the administration of these extracts must be regarded as purely experimental.

## RESUSCITATION OF CASUALTIES

Experience on active service and at home has shown the importance of resuscitation work, and made it plain that this work needs to be carried out in a separate department with its own premises, specially allotted and carefully trained staff, and with its own equipment as distinct from that of the rest of the hospital. The team in charge should be a physician experienced with junior officers adept at transfusion and nurses or orderlies familiar with all the simple apparatus used. All the staff should be [illegible] is a procedure [illegible] work under adverse [illegible] of lighting. Apparatus is required for the [illegible] with an ample stock of blood, plasma [illegible] the administration of the transfusion [illegible] ample [illegible] for cutting down and inserting a cannula [illegible] oxygen, arresting haemorrhage, making [illegible] blankets and [illegible] and treatment of collapse. There should be a plentiful supply of [illegible] blood pressure apparatus [illegible] left in position on a patient for several [illegible]. If these are provided [illegible] will save [illegible] much [illegible].

On reception all cases, except those of head injuries, should be placed in the head-low position between blankets, [illegible] warmed, and the clothes removed with scissors. Common sense will dictate whether a case is better left on a stretcher for a time or whether an immediate move into bed is justifiable. In the former case the stretcher should be placed on the bed. Manipulation [illegible] and [illegible] should be reduced to a minimum.

## ASSESSMENT

The first requirement is to make a clinical estimate of the state of the patient and to determine as far as possible the [illegible] and psychological [illegible] injury [illegible] the nature of those wounded [illegible] suffered [illegible] reduction in blood volume either from blood loss or plasma loss. One [illegible] the possibility of [illegible] embolism, and [illegible] judge whether [illegible] the symptoms [illegible] in the distressed state. Having made these assessments [illegible] treatment can be prescribed. In making this assessment it has been found that the amount of [illegible] or pain [illegible] the severity of the [illegible] mental state [illegible] pulse rate [illegible] of the [illegible] usually [illegible] from the blood pressure reading. The [illegible] blood loss [illegible] may [illegible] a reasonable blood pressure.

The blood-pressure [illegible] single reading [illegible] may be regarded [illegible] measure [illegible] making [illegible] ment. A [illegible] blood pressure [illegible] blood pressure which [illegible] to fall despite [illegible] treatment is always a serious sign. A [illegible] blood pressure [illegible] correlated with the nature and extent of the injuries. If [illegible] appears to be [illegible] high in relation to the probable [illegible] blood loss [illegible] reading needs to be [illegible] high [illegible] may be found in experienced [illegible] subjects [illegible] the range of [illegible] treated [illegible] with [illegible]

It should be very [illegible] to have full knowledge of the [illegible] and [illegible] in order that these may be [illegible] with [illegible] the [illegible] of the most important [illegible] of equipment [illegible] large [illegible] blankets and [illegible]

TREATMENT

Relief of pain [illegible] morphia [illegible] warmth with hot blankets and hot-air cradles [illegible] by mouth, preferably [illegible] drinks such as hot coffee, all [illegible] a pinch of salt should be a routine [illegible] and [illegible] local wounds from which [illegible] should be [illegible]

Sympathy and [illegible] of all personnel [illegible] important. All who are judged [illegible] blood [illegible] whether this be shown by low blood pressure [illegible] from the wound [illegible] such [illegible]

*Choice of Fluid for Transfusion.*—On the principle that those who have lost blood require blood, those who have lost plasma require plasma, and those who are [illegible] require [illegible] is greatly influenced by the supplies available. Blood [illegible] is not always [illegible] in large amount at the right time and in the right place, whereas stocks of durable [illegible] plasma or serum in fluid or dried form can be accumulated [illegible] without waste. Furthermore the primary [illegible] of the transfusion [illegible] blood volume with a fluid which will remain in the circulation and [illegible] far more vital than the [illegible] of the lost oxygen-carrying power. Plasma or serum are therefore suitable [illegible] of blood [illegible] the restoration of blood volume [illegible] frank haemorrhage [illegible] when the transfusion needs to be large [illegible] blood [illegible] available for at least one pint in three to be blood [illegible] part of the oxygen-carrying power [illegible] be restored. On the other hand [illegible] plasma loss it is plasma [illegible] that the corpuscular content [illegible] of the circulating fluid [illegible] Saline or [illegible] being [illegible] are not suitable for blood volume [illegible] that [illegible] only [illegible] short time which the fluid [illegible] in the circulation [illegible] in large amounts they [illegible] pulmonary [illegible] saline or glucose-saline should be restricted entirely to those [illegible] suffering from dehydration, as shown by dry mouth [illegible] appearance, long delay between wounding and reception. In these the effect of saline is remarkably beneficial. Every pint of saline should be alternated or mixed with a pint of 5 per cent. glucose.

*[illegible] to Transfuse.*—The [illegible] the transfusion is to [illegible] replacement of the [illegible] blood lost and the [illegible] should be controlled by [illegible] determination. [illegible] have been especially investigated from [illegible] aspect (K[illegible] Maycock and Whitby, 1941) [illegible] to the [illegible] transfusion is the effect on the blood pressure [illegible] of 10 to 20 mm. Hg [illegible] When the [illegible] rise does not [illegible] expected. It can therefore be [illegible] blood pressure of 80 mm. Hg will probably require the [illegible] restore the blood pressure to a point sufficiently high [illegible] position. It may be assumed [illegible] blood pressure is persistently below 100 mm. Hg will [illegible] the administration of one or two pints.

*Rate of Transfusion.*—Transfusion [illegible] much greater speed than is used in ordinary medical [illegible] be assumed that prior to [illegible] dition and that the rational procedure [illegible] quickly as possible. The early stages [illegible] conducted at the rate of a pint in ten minutes [illegible] the region of 90 to 100 mm. Hg, when the rate should be [illegible] and afterwards adjusted according to [illegible] a fast rate is not well tolerated and [illegible] of rigors. In such cases a slowing of the [illegible]

*Maintenance of Condition.*—R[illegible] ward. A patient may deteriorate rapidly [illegible] operating theatre itself because of the [illegible] there further loss of blood [illegible] therefore for the last bottle set up in the [illegible] drip rate so that this accompanies the [illegible] up should there be any falling off in the [illegible]

*Oxygen Administration.*—[illegible] by the administration of oxygen, which [illegible] normal. The administration [illegible] practical purposes the B.L.B. mask is the [illegible] Oxygen should be regarded as an adjunct [illegible]

### EXPERIMENTAL [illegible]

The foregoing straightforward opinion [illegible] on a vast amount of experimental work and [illegible] observations on the human subject. [illegible] some of the more important work.

*Blood Volume Reduction.*—Keith (1919) [illegible] wounded in the last war much [illegible] circulating blood volume was the [illegible] exhibiting the symptoms of shock [illegible] experimentally by many workers.

Gasser, Erlanger and Meek (1919) [illegible] in animals, no matter what method [illegible]

[illegible] blood [illegible] haemorrhage either [illegible] found also in cases [illegible] to explain [illegible] shock and [illegible] great loss [illegible] the effect of [illegible] haemorrhage [illegible] emphasizes the relationship between the [illegible] haemorrhage alone and reduction by some [illegible] 1933). Shock and haemorrhage [illegible] in the former haemocon- [illegible] occurs (Moon and Kennedy [illegible] there is congestion of the [illegible] oedema and petechial haemorrhages [illegible] anoxic condition of the tissues. [illegible] traumatic shock is probably [illegible] Parsons (1938) produced [illegible] rarely observed [illegible] low blood pressure for [illegible] changes in the tissues [illegible] shock. More recently Dunphy [illegible] post-mortem microscopical [illegible] hours from thermal and [illegible] capillary damage and closely [illegible] after a longer period [illegible] evidence of capillary [illegible] The available evidence suggests [illegible] haemorrhage are in some [illegible] there is damage to the [illegible]

[illegible] than the diminution of [illegible] for Peyton Rous [illegible] of 70 to 80 per cent [illegible] provided the [illegible]

[illegible] in cases of shock [illegible] With few exceptions [illegible] the destruction of [illegible]

[illegible] by the work of the [illegible] that crush tissue [illegible] in the damaged [illegible] and [illegible] of Dale, Laidlaw and Richards [illegible] Special Report Series No. 26 1919 [illegible] first [illegible] loss [illegible] capillary [illegible] through [illegible] pressed that [illegible] intestine [illegible] and shock in [illegible] suggested that the [illegible] formed in injured [illegible] absorbed.

The experiments of Cannon and Bayliss [illegible] 1919 led them to conclude that the [illegible] by poisonous substances formed in the [illegible] little or no histamine [illegible] Among them Dragstedt and Mead [illegible] vasodepressor [illegible] in the blood and [illegible] shock. Rose and Browne (1940) [illegible] the total blood histamine [illegible] this decrease might be due to [illegible] intestinal tract or injured tissue. [illegible] demonstrating the presence of [illegible] may play some part in shock.

*Fluid Loss at the Site of Injury.* [illegible] in America which tended to sh[illegible] toxic substance was formed in injured [illegible] and that [illegible] mental work adduced in [illegible] successfully.

Cannon and Bayliss had shown that if the blood supply [illegible] limb were occluded the blood pressure [illegible] If the circulation were restored the blood pressure [illegible] and shock developed. [illegible] compared its weight with that [illegible] increase in weight of the injured limb [illegible] and plasma) was insufficient to account for the [illegible] and Bayliss also showed that preliminary [illegible] did not prevent the onset of shock.

Blalock (1930) and Parsons and Phemister (1930) produced [illegible] by traumatizing one hind-limb. They found on comparing [illegible] of the injured and intact extremities that the [illegible] leg, which was assumed to be due to loss of blood and plasma [illegible] culation, amounted in most instances to [illegible] volume. The method of estimation [illegible] Cannon was criticized on the grounds that [illegible] in the loose inguinal and retroperitoneal tissues [illegible] when the thigh was injured. Blalock [illegible] ties through mid-abdomen and then [illegible] up the spinal column. Parsons and Phemister [illegible] by severing symmetrically the tissues [illegible] spite of this difference in technique both [illegible] of blood and plasma into the injured [illegible] pressure. No evidence of toxic substances in the [illegible] injured limb was found. Cannon and Bayliss [illegible] to produce shock in animals after [illegible] from the injured leg. Blalock showed that when [illegible] was carried [illegible] shock could still be produced. He observed [illegible] the [illegible]

[illegible] fall became less steep instead [illegible] the blood were carrying poisonous [illegible] Parsons and Phemister state that if [illegible] obstructed the shock develops [illegible] than when the veins are patent.

[illegible] to demonstrate the presence [illegible] both by introducing it in various [illegible] condition had been weakened [illegible] resources.

[illegible] found that in mild trauma [illegible] the site of the injury to explain [illegible] this fluid analytically closely [illegible] and Blalock (1931) that the [illegible] thick blood or red blood [illegible]

[illegible] important part in causing [illegible] recognized. That it alone is [illegible] other factors must be con[illegible] position now held by [illegible] of shock. Now they are [illegible]

[illegible] theory of the origin of shock [illegible] when it was superseded [illegible] in favour of this [illegible] and Shore. They first performed [illegible] and [illegible]. They next [illegible] site of injury and con[illegible] the arterial shock and then [illegible] produce shock [illegible] to the limb by the nerves [illegible] circulation [illegible] second [illegible] results of the experiment were con[illegible]. They also showed that the elimination [illegible] (2) spinal cord section (3) spinal [illegible] of shock. From their results they [illegible] nervous impulses are both [illegible] attempting to diagnose on their [illegible] that the nociceptive impulses [illegible] fluid loss. No attempt was made [illegible] the circulatory collapse. [illegible] Bell, Clark and Cuthbertson [illegible] the same results. The [illegible] is the anaesthetic [illegible] could obtain evidence [illegible] but under no other [illegible] and Webb (1940) however satisfied [illegible] and Shore's experi[illegible]

[illegible] and Lyon (1909) Malcolm

(1938) [illegible] contended that [illegible] peripheral vasodilatation [illegible] exhaustion [illegible] did not occur [illegible] experimentally that the [illegible] that the adrenal medulla [illegible] (1936). It is well known that [illegible] liberated [illegible] that the [illegible] of plasma [illegible] The blood [illegible] as 27 per cent. The explanation [illegible] the sympathetic [illegible] centres in the experimental [illegible] and splanchnic [illegible] increased permeability of the capillaries [illegible] (1934) has also pointed out that [illegible] system and exercise [illegible] small vessels in muscles and [illegible] spaces. Normally [illegible] but in the shocked patient this pumping action [illegible] contrast to this evidence in favour of the possibility [illegible] being active in shock, Davis (1937) produced [illegible] and the injection of adrenaline and histamine [illegible] changes produced by adrenaline did not resemble [illegible] rrhage or trauma and concluded that [illegible] the adrenal medulla was active in shock. Similarly [illegible] (1939) were unable to show [illegible] a diminution in blood volume.

While there is evidence for both sides [illegible] adrenal medulla together with the sympathetic [illegible] shock, the importance of this activity [illegible] probably regard it as an accompaniment of [illegible]

Adrenal Cortex. The similarity [illegible] trauma and the condition which follows [illegible] That there may be a relative deficiency [illegible] mone in shock has been [illegible] amongst other things a hypo[illegible] viscosity, increased pulse rate, and [illegible] and trauma. Swingle and his collaborators [illegible] testines and muscle) in adrenalectomized [illegible] capillary atony caused by the lack [illegible] ability of the capillaries, and that [illegible] effective in raising the blood pressure [illegible] simultaneously. They also observed that [illegible] blood pressure raising effect. Weil and Browne [illegible] increased excretion of cortin [illegible] tion may be connected with the earlier [illegible] Selye [illegible] animals to various damaging agents [illegible] the adrenal cortex. The changes in the [illegible]

[illegible] time after injury, but there do not appear [illegible] in human beings dying in shock. [illegible] of the body's reactions to an injurious stimulus is [illegible] of the adrenal cortex, and that therefore the cortical principle [illegible] may be useful. However, the finding of increased urinary excretion of [illegible] in human beings would suggest that excess amounts [illegible] produced and that there is no diminution [illegible].

[illegible] the existing data for the [illegible] of the adrenal gland. Certain experimental results, however, indicate that adrenal cortical principles may be useful in the treatment of [illegible].

[illegible] and [illegible] (1934) produced a fall in blood pressure by injecting [illegible] of the [illegible] and [illegible] prolonged [illegible] prevented a fall in blood pressure, and the [illegible]. Selye and Dosne (1940) produced shock in rats by injuring the thigh muscles and [illegible]. The survival period of the group [illegible] was significantly longer than that of the [illegible] group. Desoxycorticosterone and extracts of adrenal cortex were [illegible]. Selye, Dosne, Bassett and Whittaker (1940) found that [illegible] ineffective but actually harmful in the treatment of [illegible] animals. Cortical principles have also been claimed to be helpful in the treatment of [illegible] in which the blood sodium is lowered.

It is not possible at present to assess the usefulness of cortical preparations in the treatment of shock or the part played by the adrenal cortex in producing the state of shock. The present evidence would indicate that such preparations may be found to be useful in selected cases.

This short survey of some of the literature is not intended to be a comprehensive review. Its purpose is to touch upon some of the more important aspects of the experimental work on shock, and to give an idea of the many-sided character of the condition without undue emphasis upon any single feature.

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## A PROVOCATIVE DOSE

By Surgeon Lieutenant-Commander H G SILVESTER, O.B.E., R.N.

At the outbreak of war it was realized that many cases of nervous breakdown would result from the strain of service under the conditions of modern warfare. Many eminent psychiatrists joined the Military Medical Services and were appointed to strategical positions for the reception of mental cases. And so in a very short time it was obvious that all conditions of mental upset would receive first-class treatment.

Naval Medical Services have always worked with two aims in view: first, to prevent disease, and secondly, if failure has resulted, to give the best treatment that circumstances will allow. Have not the specialists in psychology rather forgotten the first aim? Every medical journal I read these days has at least one article on the 'Aetiology and Treatment of War Neuroses'. However, the only mention of prophylaxis I have ever seen has been that men with bad 'mental histories' should be excluded from military service and that men should not be forced to do jobs beyond their intelligence. Perfectly true, but one does not need to be a psychiatrist to appreciate it.

I have often wondered if the psychiatrist really understands the difference between the mental stresses of a sailor's life and those of a person living ashore. At times there is equal danger to life and limbs; however, while the sailor at sea is in danger twenty-four hours a day, the man ashore is told by a siren when he is in danger and when he is safe. Just to be at sea is terrifying enough at times. Is it realized that a great proportion of naval ratings are for 'hostilities only' and have never been to sea in their lives before?

I understand that most of the cases of war neuroses are caused because men do not understand the reactions of the body to the presence of danger. Why not give them this understanding before the breakdown occurs and not after? Mass therapy by explanatory lectures has proved successful for civilian cases of neurosis. Why not mass prophylaxis for sailors? I have given such talks on the messdecks and to ratings under training, and one [illegible] then have [illegible] should be [illegible]. The talks were designed primarily to remove the anxiety [illegible] of bombing. [illegible] could be [illegible] at least they [illegible]. Ill rural ratings benefit [illegible] the mercy of the merchant [illegible] without any chance to defend themselves.

I have [illegible] hoping for an exchange of views between Medical Officers [illegible] Specialists. I necessarily deal with cases [illegible] expert treatment and who would welcome [illegible] mental hygiene. I can assure my intending [illegible] listened to attentively, during a [illegible]

The following [illegible] I have given many times. We have [illegible] keeping the body healthy. We [illegible] with this or that soap, to eat a [illegible] apple a day or to take [illegible] early morning tea. Having run [illegible] out it—and having obeyed all [illegible] disappointed to find that we [illegible]

[illegible] the mind healthy. In particular I [illegible] breakdown occurring in war time in [illegible] applying this knowledge in nervous [illegible]

All [illegible] instincts. An instinct may be defined [illegible] though we can control an instinct we [illegible]

The [illegible] with are: (1) The instinct to feed. (2) the [illegible] the instinct to avoid being hurt. It is the instinct [illegible] talk about. In the presence of danger this [illegible] emotional upset called fear. The natural [illegible] as far away and as quickly as possible [illegible] In other words, to run.

We [illegible] upset our health—well fear is a worry [illegible] of being hurt. For practical purposes [illegible] caused by fear. The first and most easily [illegible] when a person is suddenly faced by a [illegible]. The second is caused by worrying [illegible] in the future. The two conditions are closely [illegible] called acute fear and chronic fear, just as we [illegible] illness.

[illegible] at first there is a feeling of helpless [illegible] stands on end. The body is bathed [illegible] of the eyes become dilated. Urine and faeces [illegible] passed involuntarily. If by this time the individual has not been killed his mind takes charge. There is an overwhelming desire to get away from the danger. The legs start to run—and for a few seconds one thought fills the mind [illegible] as quickly as possible [illegible] period of time the mind [illegible] power of reasoning [illegible] full charge. The power of reasoning then [illegible] and the individual [illegible] the danger [illegible] may.

Chronic [illegible] of mental [illegible]. The thought [illegible]. This causes an [illegible] concentrate [illegible] is lost and [illegible] worse the [illegible] appetite [illegible] the work is [illegible] constipation [illegible] found.

It is [illegible] to the [illegible] than [illegible] so much [illegible] fear upsets the bodily [illegible] person [illegible] can think of little else. His behaviour [illegible] to be suffering from a nervous breakdown. [illegible] of the body to the presence of danger may cause [illegible]. A sickness of the mind and a sickness of the body.

When the mind is sick there is an ever present sensation of unrest at the back of conscious thought. The thoughts keep returning to ways in which one can get hurt. Bombs, mines, torpedoes and shells, fire, being drowned or trapped below. If the will power is strong enough, reasoning says the chance of this happening is very small and the nagging thoughts only come up from time to time. If self control is overpowered then the fears fill the mind to the exclusion of all other thoughts.

In sickness of body due to worry the person is not conscious of any particular mental unrest but all the symptoms caused by chronic fear are exaggerated. The peace of mind of the individual is safeguarded by his thinking that his ill health is due to a bodily upset and not to the nagging worry of chronic fear of being hurt. The symptoms are so real that the person may become bedridden. They can only be relieved by his understanding his condition.

Now, strange as it may seem, in war time the thing that most men worry about and fix their attention on to such an extent as to cause a nervous breakdown is rarely the fear of being hurt. The most common cause of anxiety is the fear of the individual that he might be a coward. You must understand that fear is a natural instinct but man is trained from extreme youth to believe that to avoid danger when he could shield others by meeting it is a dastardly cowardly act.

We are taught, and I believe it myself, that to be a coward is the biggest disgrace that can happen to a man. So now we find that we have two opposing forces. An instinct to avoid danger and a will or self control which makes us disregard this instinct.

It is being conscious of the mental unrest due to fear that leads to such a state of anxiety in a man's mind that he may be able to think of little else and eventually has a nervous breakdown. The anxiety is not because he may be hurt. [illegible] he thinks that his mental unrest [illegible] being [illegible]. [illegible] recommend that everyone, even the [illegible] knows he [illegible] being hurt and that it is only [illegible] him away then [illegible] he stops worrying, a possible nervous breakdown is prevented, and his bodily health is restored.

Another [illegible] gives mental unrest is the fear that in the time of crisis I shall be so nervous that I shall not be able to think of the correct thing to do. The answer to that is the assurance given to us by history—that the only men who may fail in an emergency are those who have not trained themselves to deal with such an emergency. This explains the confidence of well trained troops and why nervous breakdowns (from this cause) are so rare among them. It is only the untrained person who gives way to panic as I described when talking of acute fear.

Up to now I have only spoken of single causes of anxiety. In these days of total war a man usually has other worries besides the fear for his own safety. He has fear for the safety of his wife, his children or his home, just to mention a few—and though these are not usually the primary worry, they add to his mental unrest.

We are all agreed that any sort of worry upsets the healthy working of the body, and now I have told you how fear affects it. Though we cannot [illegible] it we must and we can control it. The healthier the body the stronger the will power. Therefore, by keeping as fit as possible we can exert more [illegible] and can stem the mental upset. However, we all get depressed from time to time and it is then that our worries big and small come near to beating our will power. Our mind gets so full of worry that we feel it [illegible]. What do we normally do about it? Why, of course, one finds a friend or some trustworthy person to tell our troubles to in detail, ask his [illegible] compensate him for listening, without the slightest intention of [illegible] it, and then we go feeling much better. It acts like a safety valve and the pressure is released. The reason why men do not do this about their [illegible] is not as they try to make out that they make others nervous, but because they are afraid they might be looked down on as cowards. So [illegible] they do not sleep well, feel restless and irritable, and lose their appetites. However, if everyone knew what I have told you, the [illegible] man has a way of easing his anxiety right handy. I am not asking [illegible] broadcast it to the world. Only to talk it over with a friend. If the person does not give you a sympathetic hearing you may be certain that his fear [illegible] greater than your own—and that will help you.

So in conclusion I want to remind you and to impress on you these points: To be afraid is natural—to run away is cowardly. If you are efficient in your [illegible] you need have no fear of your behaviour in an emergency. Admitting your fears to a friend makes it easier. In nine cases out of ten he will be feeling exactly the same. All my talk cannot remove the causes of anxiety, but if you have followed me, your understanding will prevent the mental and bodily upsets due to living dangerously.

III

## MEMORANDUM OF THE IMMEDIATE [illegible] OPEN HEAD INJURIES

### Definition

By open head injuries are understood scalp wounds and [illegible] injuries of the skull. Closed head injuries, including fractures of the base of the skull, were dealt with in a previous memorandum (viz. B.R.148 [illegible]) [illegible] also be consulted.

### Preamble

Experience of head wounds so far gained in this war [illegible] modification of our views as to prognosis and management. Whilst [illegible] thing is to be said for the early excision of head wounds [illegible] be of too radical and extensive a character. In general it [illegible] that for the most part, retained metallic fragments appear to be [illegible]tively clean and too enthusiastic attempts to remove them, [illegible] are deeply placed, are to be deprecated.

The complications of open head injuries may be classified:

(1) Early, viz. shock and hæmorrhage, and

(2) Late, viz. infection and the crippling effects of [illegible] functions of the brain.

Our objects in treatment therefore must be to arrest [illegible] deal with shock, prevent or limit infection in the wound, [illegible] of damage to the brain and its coverings and guard [illegible] sequelæ.

### Selection of Cases

When a number of men are wounded at the same time the types of injury encountered may vary considerably (e.g. burns, limb [illegible] chest, abdominal and head injuries). It has to be decided which [illegible] the most urgent attention and which may safely be left [illegible] also important to recognize at once those who are in extremis and [illegible] little can be done by surgery.

Extensive wounds or multiple injuries by no means prove that a case is hopeless, but severe shock from which the patient fails to show signs of rallying when restorative measures are instituted, and profound and deepening coma, even if at the same time the pulse is good, [illegible] features. The continuous escape of brain matter from the wound in a patient who is profoundly comatose is of the gravest prognostic significance. Perhaps the most important single prognostic sign in head injuries is the depth and duration of coma.

When associated with an open injury [illegible] depression is already present, coma is of materially [illegible] than when accompanying a closed injury.

The critically injured patient who is going to recover usually shows some sign of spontaneous improvement within a few hours, and [illegible] highly important in enabling us to reach a [illegible].

It must not be forgotten that unconsciousness may be [illegible] brought on by morphia, especially if large doses have been given for pain and shock.

### Shock and the General Condition of the Patient

We must not lose sight of the fact that we are not dealing with a case of a head wound but with an individual who has sustained a head wound and may be badly shocked, has lost much blood and sustained multiple injuries. The patient must be made warm and placed at rest while the arrest of hæmorrhage and the restoration of blood volume are brought about and antitetanic serum is given. The question of morphia is always important in these cases because of its effect upon the respiratory centre. It should be given in small doses only and repeated if necessary; one sixth of a grain may be given at once with a further twelfth at two hourly intervals as required.

While the arrest of hæmorrhage and the restoration of the shocked patient are our first objects, it is equally important to protect him from, or at least minimize, the ravages of infection, and this involves the treatment of the wound and the use of sulphonamides.

### Neurological Examination

If possible an examination of the nervous system should be made in all cases and the result noted, particular attention being paid to the patient's ability or not to move the limbs, the state of the pupils and the reflexes.

### X-ray Examination[1]

Whenever possible antero-posterior and lateral views of the skull should be obtained as soon as possible. The extent of a fracture, evidence of the presence of foreign bodies and of indriven fragments of bone and the thickness and condition of the skull itself form useful data for the operating surgeon.

### Sulphonamides

Sulphapyridine should be given, 2 grm. at once and 1 grm. at four-hourly intervals afterwards for forty-eight hours, or longer if required. Finely powdered sulphathiazol is valuable as a dusting powder for the wound, especially in the case of a compound fracture. It may be applied with gauze or blown from an insufflator. Sulphathiazol powder does not require sterilizing. Quantities up to a dessertspoonful may be used with safety.

### Scalp Wounds

It is necessary to avoid regarding these as trivial injuries. The extreme vascularity of the scalp may result in considerable blood loss and any wound which penetrates the scalp introduces the possibility of an intracranial spread of infection by way of the emissary veins connecting the sub-aponeurotic lymph space beneath the scalp with the intracranial venous sinuses. Death has resulted from such spread of infection through undamaged tissues and, as is well known, the potential space beneath the scalp constitutes one of the "danger areas" of the body. In modern warfare scalp wounds are usually produced by impact at considerably higher velocities than occur under peace conditions extensive damage to the skull [illegible] of the brain are therefore more commonly [illegible] with the [illegible] injury.

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[1] In order to obtain clear films debris should be combed out of the hair before making this examination.

### OPEN INJURIES OF THE SKULL

These are compound fractures and [illegible] should be [illegible] applying to all compound fractures [illegible] least minimize the infection [illegible] clean one.

### CARE NOT TO INCREASE DAMAGE

Great care must be taken [illegible] into a closed and clean fracture [illegible] the skull [illegible] already done to the brain. Through [illegible] has resulted [illegible] too extensive surgery carried out with the apparently [illegible] sighted object of completely excising all damaged [illegible] placed missiles. Contrary to what was the case in [illegible] mud of Flanders and pieces of uniform were often [illegible] fragments (such as may result from pieces of [illegible] have been found inside the skull in this war [illegible] tively clean, and more harm than good will usually [illegible] to remove deeply placed ones.

### THE SCALP

The hair should be cut away from the edges [illegible] scalp itself shaved either for some distance around the [illegible] according to the nature of the wound and the [illegible]. If the whole scalp has not been shaved [illegible] spirit (70 per cent.) should be placed [illegible] area and the surrounding hair. [illegible] gauze. The incision is made through the [illegible] keeps back stray wisps of surrounding hair [illegible] themselves into the field of operation [illegible] the gauze.

### FIRST AID

Conditions may be such, e.g. small [illegible] that only first aid measures can be carried out. In addition to [illegible] of shock and the arrest of hæmorrhage the best course then may be to do little to the head wound but cut away the hair, place a gauze pad soaked in 1:1,000 acriflavine in the wound and bandage this lightly in place, or fix it in position with a few scalp sutures. The pressure of the pack will aid the arrest of hæmorrhage while the acriflavine will minimize infection [illegible] damaging the brain.

### TREATMENT IN AN OPERATING THEATRE

But whenever possible scalp wounds and penetrating injuries should be treated as soon as possible in a properly equipped operating theatre.

*Anæsthesia*: either local infiltration with [illegible] 1 per cent. containing adrenaline [illegible] or general anæsthesia should be used. Local infiltration has been found very satisfactory in practice and should always be used if blast effects on the chest are present, e.g. dyspnoea, &c.

*Shaving* should be adequate and the scalp well washed with plenty of soap and hot water. Spirit (70 per cent.) is then applied. In the case of a comparatively trivial scalp wound an area of 3 in. on all sides of it should be clearly shaved; for severe wounds and penetrating injuries the whole scalp should be shaved.[1]

### EXCISION OF WOUND, REMOVAL OF DAMAGED AND DEVITALIZED TISSUE AND CLOSURE.

A minute margin (say ⅛ in.) is all that it is necessary to excise. If it is not possible to bring the lips of the wound together without tension, relaxing incisions which go down to the bone through healthy scalp should be used. The wound should be inspected carefully to see whether the bone has been damaged, and, if not (i.e. we are dealing with purely a scalp wound) it is preferably closed in two layers, the galea aponeurotica (epicranial aponeurosis) being closed with fine interrupted silk sutures, the skin with interrupted sutures of waxed thread or silk-worm gut. As the object is to convert an open into a clean, closed wound, no drainage is necessary if the procedure outlined above is followed early and effectively. In the heat of an emergency, when it may be necessary to deal with a series of cases with rapidity so as to complete the wound excision within the eight or ten hours when it will be most effective, closure may be satisfactorily effected by a single layer of interrupted sutures of fine silk, waxed thread or silk-worm gut; but in all penetrating injuries where the dura has been opened the closure should be in two layers to minimize the likelihood of cerebrospinal fluid leakage.

One or two points may be noted.

(*a*) *Bone* should not be removed unnecessarily. From what is sometimes seen it has apparently been thought good treatment to bite out and removed large pieces, leaving extensive areas of bony defect. This is unnecessary and undesirable and a minimal amount only should be removed. Large cracked pieces, because they are cracked, do not, unless obviously contaminated, call for removal, and at times it is possible to remove, cleanse and replace pieces of bone. It has been found that in the injuries of this war a degree of comminution and depression of the inner (vitreous) table far exceeding the apparent damage as shown by the state of the outer table commonly occurs. Surprisingly, however, the dura in such cases is not often penetrated. The depression must be corrected by elevation or removal of fragments so that no encroachment upon the intracranial capacity remains.

(*b*) *The Dura.*—If undamaged the dura should not be opened because of the possibility of introducing infection, and if torn only obviously badly damaged pieces should be removed.

(*c*) *Cerebral Tissue.*—The same remark applies; only obviously dead or badly damaged tissue should be removed.

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[1] When, as is often the case, the hair is plastered with debris, it should be first combed with a small-tooth comb, then cut with scissors. Powdered soap or shaving cream is useful to make a lather preparatory to shaving; both have been found better than other soap.

(d) *Drug* [illegible]

(e) [illegible]

(f) *D*[illegible]

(g) [illegible] in the [illegible]

RECORD MAKING

Particular care should be taken [illegible] as fully and accurately as possible [illegible] and after treatment and such points [illegible] removed whether sulphonamides and [illegible] in what dosage

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## DOUBLE DOUBLE CAULDRON BUBBLE

By SURGEON LIEUTENANT COMMANDER B S LEWIS R N

In these days when many of the better-known remedies are [illegible] difficult to obtain and more and more substitutes are brought [illegible] it might be well to scrutinize the ancient writings and see what [illegible] can be derived from them Let it not be forgotten that the [illegible] digitalis was indirectly due to heeding an old wife's tale

Cures were classified by the ancients as lawful or the reverse In the former case the cure was dependent upon divine aid while in the latter they were achieved by sorcerers witches wizards and cunning men who [illegible] maladies by spells charms cabalistic words characters images [illegible] ligatures philtres and incantations Learned divines also [illegible] resist exorcisms these witches and magicians had St Catherine's wheel [illegible] printed on the roofs of their mouths or elsewhere!

"Witches and imposters" said Lord Bacon "have always held a [illegible] petition with physicians" Even the most illustrious names are involved in dubious practices and included among the champions of sorcery is Solomon who says Marcellus Donatus "cured all the diseases of the mind by spells and charms and drove away devils" Eleazar did the same before Vespasian while Abraham wore a precious stone about his neck which cured [illegible] when looked upon

Nevertheless if Godelmannus be right in his assertion that Satan [illegible] excellent physician, then these heroes may have been correct in their decision to follow a different path to Laurels M.D.

Unfortunately the division of the advocates of the two practices is no clean cut and easy task, and even Sir Theodore Mayerne, physician to three English sovereigns and said to have been Shakespeare's Dr Caius, was not altogether free from suspicion. On many occasions he prescribed such strange remedies as the heart of a monk ripped up alive, a portion of the lungs of a man who had died a violent death, or the hand of a thief who had been gibbeted on some particular day, to be taken internally. Each one a gastronomic feat of no low order, the threat of a repetition of the dose must surely have cured the most stubborn malingerer—the purpose to which many of us, in deference to a great physician, will prefer to think it was directed.

Throughout the ages, however, there can be no single object so frequently met with and regarded with such mixed feelings as the far-famed mandragora of which such wonderful accounts have been related by the ancients. To this day it is sold in the bazaars of the East as a root of magic properties by reason of its supposed resemblance to the human shape. The mandragora, a blackish hairy root, was gathered with ceremonies. Three times a magic circle was drawn round it with a naked sword, and the person who was daring enough to pluck it from the earth was subject to manifold dangers and diseases unless under some special protection. It was not unusual to get it extracted by a dog who was fastened to it by a cord and then whipped off until the precious root was pulled out. Often, it was asserted, the mandragora uttered piteous cries and groans when thus torn from the bosom of Mother Earth. Albertus the Great affirms that the root has a more powerful action when growing under a gibbet, and is brought to greater perfection by the nourishing secretions that drop from the criminal's dangling corpse. Among its wonderful properties were those of detecting hidden treasure and doubling the amount of money locked up with it in a box. It was also supposed to possess the delightful faculty of increasing population and exciting love, and the Emperor Julian writes to Callixenes that he is drinking the juice of mandragora to render him amorous.

In Roman times the amula was a small vessel filled with lustral water which was carried or hung round the necks of children as a protection against supernatural agency, the evil eye, magical arts and sorcery, and was considered so effectual that Gower tells us an oath was administered to persons about to fight a legal duel that they had 'nae charm, nae herb of virtue'—a practice of which St Chrysostom and others of the Fathers were loud in condemnation.

As time went on more and more substances acquired virtues of healing, at first largely confined to jewels, but later spreading to the herbs and animal kingdom, and finally to combinations of charms and incantations both written and spoken. Thus 'a sapphire helpeth agues and gouts, and stancheth bleeding at the nose being often put thereto', and again, 'a topaze healeth the lunatic person of his passion', and at a later period 'heliotropia stancheth the blood, driveth away poisons, preserveth health, yea, and some write that it provoketh raine and darkeneth the sunne, suffering not him that beareth it to be abused'.

Nails driven into an oak tree prevented the toothache, while the cure of [illegible] could be undertaken [illegible] possessing mass [illegible] thrice dried and pulverized [illegible] taken as [illegible] A dead man's hand could dispel [illegible] the glands by [illegible] the [illegible] but the hand [illegible] from the [illegible]

[illegible] supposed [illegible] glance [illegible] philosophers [illegible] of the opinion that all things were [illegible] and preferred [illegible] before the other [illegible] plants. Whether [illegible] many [illegible] gold pill [illegible] drop [illegible] is an infallible [illegible]

Gorges [illegible] part of the Koran [illegible] of [illegible] many times and give them [illegible]

Father Jerome Mercurialis strongly recommends the [illegible] for the falling sickness and gives the following method [illegible] ascertaining in which limb especial virtue resides. To what extent the worthy Father had his tongue in his cheek as he wrote this we can but guess.

"Knock the beast down, when he will immediately lift up that leg which is most efficacious with which to scratch his ear. Then you must be ready with a sharp scimitar to lop off the medicinal limb and you shall find an infallible remedy for the falling sickness treasured up in his claws."

Yarrow worn in a little bag on the pit of the stomach is also highly recommended, as is a baked toad hung in a silk wallet about the neck for the cure of scrofula. Herpes may be alleviated by the application of blood from the tail of a black cat.

The physician in doubt as to the treatment of wasting should proceed as follows: "Boil an egg in the patient's own urine until hard, then perforate it in many places with a bodkin. Place it on an anthill and leave it to be devoured by emmets, so shall the influence that destroys him be consumed."

Opticians might well bear in mind that the application of nine barleycorns to a stye will work wonders, while for the same affliction Sprengel advises the following incantation: "Fuge, fuge, [illegible]."

In the travels of Marco Polo we may read that in an attempt to conquer the Isle of Zipangu a jealousy arose between the two commanders of the expedition which led to the putting to the sword of the captives, and all heads were cut off save eight, who by the efficacy of a diabolical charm consisting of an amulet which had been introduced into the right arm between skin and flesh were rendered secure from iron to kill or wound. Upon this being discovered they were beaten with a heavy wooden club and presently died.

The medicinal power of harmonious sounds was also fully admitted, and we find Pythagoras directing that certain mental disorders be treated by music. Xenocrates cured maniacs with melodious sounds, Aulus Gellius with gentle modulations banished sciatica, and Æsculapius conquered deafness with a trumpet. Spider bites are said to respond well to intense and prolonged treatment of this nature, though in this case volume of sound rather than melody was the necessary ingredient, and here has a parallel in the [illegible] various though [illegible]. In olden [illegible] of the cure [illegible] regard [illegible].

[illegible] April 11 1681 [illegible] this morning [illegible] and hung three spiders [illegible] Lord Chancellor [illegible] Sir [illegible] my most humble [illegible] dear Mistress [illegible] spell infections [illegible] the sweet drugges [illegible] of constancy.

In [illegible] Sir Walter Scott possessed a [illegible] charm which was very much prized both by him and his ancestors but which when opened on his death was revealed to be but a collection of feathers parings of nails hair and such like trash wrapped in clay.

Lord Bacon also believed in amulets and spells and one cannot but marvel that men of their eminence observation and acumen should become converts to such superstitious practices. There can be no doubt however that mystery now as in the Dark Ages increases the power of the remedy add to this a ritual of an obscure and even terrifying nature and only the dullest sceptic fails to become impressed.

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# Clinical Notes and Cases

## TECHNIQUE OF BLOOD GROUPING

By C. A. GREEN, M.B., D.T.H.

*(From the R.N. Medical School)*

### INTRODUCTION

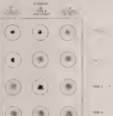
The technique of blood grouping is one of paramount importance on [illegible] of the increased application of transfusion therapy. The usual pro[illegible] typing [illegible] the patient's [illegible] glass [illegible] agglutination [illegible] require careful obser[illegible] glass slide. Furthermore the drop [illegible] of the slide and evaporation of the thin layer of [illegible] is a handicap when [illegible] patients. The alternative technique of using [illegible] reliable but has the great disadvantage [illegible] of the apparatus [illegible] the test. These difficulties have been overcome [illegible] which [illegible] for rapid working and accurate [illegible]

## [illegible]

[illegible]

## [illegible]

[illegible]



[illegible]

[illegible]

Rock the [illegible]

### INTERPRETATION

[illegible]

[illegible]

### [illegible]

[illegible]

[illegible]

## [illegible] THREE CONVULSIONS OCCURRING IN THE SAME PATIENT

[illegible] M.B., B.S. [illegible]

[illegible] H.M.H.S. [illegible]

[illegible]

[illegible] H.M.H.S. [illegible] Tongue slightly [illegible]

[illegible] palpable swelling lateral to [illegible] Nov. 1932. Albumin [illegible]

[illegible]

[illegible] by the [illegible] patient startled [illegible] marked by excitement which [illegible] passed

[illegible]

[illegible] compatible with [illegible] convulsions should [illegible]

[illegible]

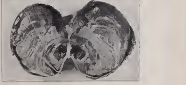
[illegible]

---

## [illegible] CONGENITAL ANEURYSM OF A [illegible] ARTERY

[illegible]

[illegible] dilated links (0·15 cm. diameter [illegible] the wall at the [illegible] probably the stumps of the [illegible] which the [illegible]. This is supported by the fact that [illegible] opened [illegible] (1·5 by 1 cm.) in the edge [illegible] being [illegible] in the aneurysm in which the blood was circulating. [illegible] microscopic examination [illegible] portions of the wall [illegible] the aneurysm without [illegible]. The [illegible] of [illegible]. No other abnormalities [illegible]. Weight [illegible].



A [illegible] view of the congenital aneurysm [illegible].

*Thorax.*—Lungs [illegible] very congested and [illegible]. Left lung weighed [illegible] oz. and right 20 oz. Heart showed [illegible]. Left ventricle [illegible] at [illegible]. Valves [illegible].

Aorta showed atheromatous changes. No other [illegible]. Weight of heart [illegible] oz.

*Abdomen.*—[illegible]. Liver [illegible]. Weight 60 oz. Kidneys congested [illegible] stripped readily. Left [illegible] oz. and right 5 oz. Spleen congested. Weight 6½ oz.

The remainder of the organs showed no macroscopic abnormalities.

*Summary.*—Aneurysm [illegible] cerebral artery situated [illegible] portion of right frontal lobe. Atheromatous changes in blood vessels.

*Cause of Death.*—Large congenital aneurysm [illegible] old dry compact blood clot.

*Microscopical Examination.*—The three pieces show the wall of the aneurysm to be composed of a thin layer of [illegible] containing very few spindle fibroblasts and no elastic fibres. Outside this there is a thin layer of [illegible] fibrous tissue which [illegible] places with lymphocytes, plasma cells and a moderate number [illegible]

[illegible]

## REFERENCES

[illegible] Beaty [illegible]

GREEN, [illegible] (1916) [illegible] **51,** 213

MacC[illegible] W. G. [illegible] W. B. Saunders [illegible] delphia and London.

MILLER and DAVIDSON [illegible] Mason and [illegible] London.

RICHARDSON, [illegible] C. [illegible] **29,** 1

## [illegible] IN THE TREATMENT OF SYPHILIS IN THE TROPICS

[illegible] H. GILMAN WELLS, M.A., B.M., [illegible] and
[illegible] S. A. SEWELL, M.B., B.S., M.R.A.[illegible]
*H.M.A.S. Hobart*

During [illegible] of twelve months serving in the [illegible] conditions [illegible] difficulties in the [illegible] which [illegible] had experienced previously, and [illegible] know [illegible] others serving under similar conditions [illegible] like experience. [illegible] the literature with the [illegible] our disposal [illegible] light upon our difficulties.

Our [illegible] usually [illegible] Nations Health [illegible] in the treatment of syphilis [illegible] approximately 5 [illegible] grm. of N.A.B. and [illegible] of bismuth [illegible] three months, followed [illegible]

Prior to [illegible] had [illegible] that [illegible] albumin in the [illegible] test before [illegible] rapidly disappeared. [illegible] the [illegible] casts in the [illegible] N.A.B. [illegible] trouble [illegible] experienced.

It would thus appear that [illegible] known [illegible] bismuth [illegible] the tubules [illegible] desquamation and degeneration of the epithelium [illegible] pathological picture not unlike that of [illegible] Bismuth is generally [illegible] arsenical preparations, and we therefore [illegible] N.A.B. [illegible]

With the [illegible] of the hot season [illegible] fresh case [illegible] on a combined course. The result was the same as that experienced in previous cases where combined [illegible] was used. [illegible] given a course of Bismol alone, with [illegible] except in one (Case 3) [illegible] albuminuria [illegible] In this case [illegible] granular casts [illegible] blood cells appeared [illegible] combined course [illegible] used. Albuminuria rarely appeared until N.A.B. [illegible] for [illegible] six days. This was [illegible] the appearance of casts [illegible] blood cells were present on two occasions.

*Case 1.*—Able Seaman [illegible] September, 1939. Diagnosis [illegible] and examination.

He was treated by combined N.A.B. and Bismol from September 20 when he reported for his third injection [illegible] Bismol was withheld and N.A.B. 0·45 grm. [illegible] 0·6 grm. On September [illegible] N.A.B. [illegible] were given. The following [illegible] cells. He was treated on the sick list by rest [illegible] fluids and [illegible]

cc*

[illegible]

[illegible]

[illegible]

[illegible]

---

## [illegible]

By [illegible]

[illegible]

(1) [illegible]

(2) [illegible]

so th[illegible] uping, [illegible] (fig. [illegible])

[illegible] purpose [illegible] is pressed [illegible] [illegible] $\frac{3}{16}$ in. [illegible] [illegible] but [illegible]

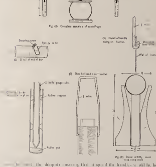


Fig. (2) Complete assembly of centrifuge

(1) Detail of handle fixing on bucket.

(2) Detail of end of bar

(3) Detail of handle on bucket

Fig. (3) Detail of $CO_2$ snow stick compression

[illegible] the [illegible] ensuring that at speed the handles would be held [illegible] centrifugal force. The buckets should be of about 1 in. internal [illegible] centrifuge tube and [illegible] rubber [illegible] [illegible] turned from [illegible]. The handles [illegible] ($\frac{1}{8}$ in.) [illegible]. The buckets [illegible] the latter to prevent [illegible] the tubes being inserted.

[illegible] found that the opp[illegible] [illegible] these speeds being entirely adequate for [illegible] purposes.

[illegible] improvised from boiler gauge [illegible] hand and the rods shown [illegible] highly strong and fulfilled their purpose [illegible] in a series of [illegible]

A [illegible] the fan [illegible] two holding bolts [illegible] the [illegible]

The [illegible] used successfully for the [illegible] in [illegible]

As constructed the apparatus [illegible] one constructed [illegible] ordinary [illegible] for the purpose.

I would like to thank Surgeon [illegible] Senior Medical [illegible] to submit these [illegible] interest and [illegible]

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## A CASE OF OSTEOGENIC SARCOMA

By [illegible] W. [illegible] F.R.C.S. [illegible] R.N.

AND

Acting Surgeon [illegible] THOMAS [illegible] R.N.V.R.

*[illegible]*

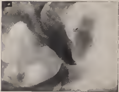
OSTEOGENIC sarcoma, though [illegible] practitioner's experience, is not [illegible] the Ministry of Health's statistics [illegible] in 1 in 7,000 of the population. [illegible] its inaccessibility makes the diagnosis [illegible] In the pelvis, however, the [illegible] difficult owing to the fact that the [illegible] on structures not giving rise to [illegible] other conditions. Of these [illegible] and Dalgaard and [illegible] [1], Negus [2] [illegible] symptoms arising [illegible] of symptoms typical of sciatica.

The authors wish to bring forward [illegible] the [illegible] of the [illegible] of the inter[illegible] symptoms [illegible] joint and [illegible] plant in the Royal Navy. [illegible] personnel and in particular of the [illegible] it seems possible that more of the [illegible] there have been in the past [illegible] following history, signs and symptoms [illegible]

Six weeks before admission to hospital the patient [illegible] of the left thigh and [illegible] carry out physical training [illegible] then published [illegible] although the [illegible]

[illegible]

[illegible]

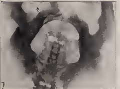


[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

We are indebted to [illegible] to publish this case.

REFERENCES

[1] [illegible] 20 [illegible]
[2] [illegible] 24, [illegible]
[3] [illegible] 44 [illegible]

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## NOTES ON THE INCIDENCE AND TREATMENT OF VINCENT'S DISEASE OF THE GUMS

By Surgeon Lieutenant (D) I. N. McCLARENCE, R.N.V.R.

The following notes, compiled during a period of two months in the Dental Department of the R.N. Hospital, Port Edgar, may prove to be of some value to Dental Surgeons of the Forces who have not had the opportunity of treating many cases of this condition and of working out a treatment routine of their own.

Considering the prominence given in the textbooks to the extremely infectious nature of the condition, it appears strange that in 40 cases out of a total of nearly 4,000 men in two months, seldom more than two and never more than three cases were found in one Mess or Establishment at any one time. If this low incidence is considered in conjunction with the following facts: (a) Vincent's organisms are frequently found in apparently normal mouths; (b) both the organisms are anaerobic; one is inclined to discount the importance of infection and pay more heed to predisposing factors. Literature upon this condition gives the following information: "The disease is observed to occur in epidemic form in barracks, jails, asylums, &c., and during the World War at times from 10 per cent. to 20 per cent. of the soldiers of a given company were ill with this disease." In short, the disease is most commonly found when general living conditions are such that the resistance to disease of any description is greatly lowered. Overcrowding, lack of ventilation and poor nutrition may be quoted as examples. Thus, while the question of infection must be given due consideration, far more attention must be paid to the general health and to living conditions.

*Diagnosis.*—The diagnosis presents few difficulties. The crater-like, punched-out appearance of the ulcers is not likely to be mistaken, and the fetid odour is almost diagnostic. Occasionally, whilst carrying out prophylactic treatment, one may come across a case in a very early stage which shows little but a marginal inflammation of the gingivae. In these cases a smear should always be taken and treatment started without waiting the result. A word of warning may be given here, as it is well known that a positive result does not invariably indicate that the disease is imminent, and conversely a negative swab does not always indicate absence of the organisms. This may be illustrated by the following case. A patient was admitted to hospital complaining of a sore throat. A tentative diagnosis of Vincent's angina was made and a swab taken the following day, April 25. This gave a negative result and the patient was treated for a septic throat. On May 6 a further swab was taken which again gave a negative result. On May 8 the patient complained of pain in the gums and was referred to the Dental Department. Unfortunately the history sheet was not available at that time and, owing to the typical lesions present, no smear was taken so as to prove the error, but it may be taken as an example of a mistake that a highly trained laboratory worker can make. The patient was treated in the routine manner and discharged in eight days after a smear had given a negative result.

*Treatment.*—The clinical signs of this condition resemble in some aspects those found in vitamin C deficiency, and this similarity has led some observers to experiment with ascorbic acid and other vitamin C deficiency treatments; however, one doubts whether positive results have been obtained on these lines. Others have seized upon the morphological similarity between the *Spirochaeta pallidum* and the *Sp. Dentium*, and experimented with N.A.B. and other anti-syphilitic compounds with results by no means promising.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

I am [illegible] Staff of the R.N. H[illegible] forbearance they have [illegible]

## ILEAL CELLULITIS

[illegible] LIEUTENANT H. M. WALKER [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

---

## THE PULSE RATE IN [illegible]

By [illegible]

[illegible] had a rate of 70 [illegible] with [illegible] marked extreme [illegible]

[illegible]

◆

## Reviews

[illegible]

[illegible]

[illegible]

[illegible]

surgery of [illegible] staggering, [illegible] [illegible] surgical tre[illegible] this book—[illegible]

THE OFFICIAL [illegible] Volume [illegible] the [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

THE EARLY TREATMENT OF WAR WOUNDS. Oxford War Manuals. By [illegible] M.B., F.R.C.S., [illegible] Surgeon to [illegible] Hospital [illegible] April 1941. Pp. [illegible] Humphrey Milford, Oxford University Press. [illegible]

[illegible]

A POCKET MEDICAL DICTIONARY. Compiled by Lois Oakes, S.R.N., [illegible] Formerly Sister Tutor, Royal Samaritan Hospital [illegible] Liverpool, F.R.C.P. Lond. [illegible] Professor of [illegible] Fifth Edition. [illegible] 1941. Pp. xx + 418 with [illegible] E. & S. Livingstone. Price 3s. 6d.; postage 4d.

The fourth edition of this work was published in 1940. The need for a new [illegible] shows its popularity. Many [illegible] have been added and [illegible] brings the text up to date. A new appendix on [illegible] techniques used in [illegible] should prove helpful to young doctors and nurses. [illegible] surprising. [illegible]

HANDBOOK OF FIRST AID AND BANDAGING. By Arthur D. Belilios, M.B., B.S. Lond., [illegible] Wimbledon Technical College and Battersea Polytechnic, &c.; H. K. M[illegible] M.B., B.S. Lond., F.R.C.P. Ed., F.R.C.S. Eng., Surgeon Lt.-Col. E.M.S., &c.; and M[illegible] Armstrong, S.R.N., S.C.M., Diploma in Nursing, University of London. With chapters by C. W. Hopkins, A.R.P.S. (Special), Superintendent, St. John Ambulance Brigade, &c. First Edition. May 1941. Pp. ix + 629. Illustrations 239. London: Baillière, Tindall & Cox. Price 7s. 6d. net.

The purpose of this handbook is to provide a concise yet complete training in first aid, written so simply that it can be as readily understood by the beginner as by the advanced student, with the object of increasing the knowledge of first aiders. Graded courses of lectures and a scheme of practical work are outlined in the appendix so that instruction as detailed in the book may be adapted to the particular needs of various types of class and classes. The text throughout is clear and simple, and though the several chapters follow relatively orthodox lines each contains just that much extra which justifies the authors' claims for completeness and marks the difference between elementary and more advanced knowledge. This is particularly noticeable in the chapters on the Thomas splint, first aid in spinal injuries, the medical causes of unconsciousness, burns and scalds and the treatment of chemical warfare, to name only a few. The illustrations are many, well chosen and executed, and there should be no difficulty in learning from them. The two final chapters on transport of the sick and injured are contributed by Superintendent C. W. Hopkins and are excellent. This is substantially a text-book, but [illegible] which needs plenty of [illegible] is very [illegible] A gift at the price of 7s. 6d.

H. L. R.

FIRST AID FOR WAR CASUALTIES. By Norman Hammer, M.R.C.S., [illegible] Order of St. John. Second Edition. May 1941. Pp. 88. London: Dale, Reynolds & Co. Ltd. Price 1s. 6d. net.

This little book is not intended to be a substitute for existing standard textbooks on pure first aid, but to be read subsequently to or in conjunction with them, so that it may be a help to first aid workers in helping to understand their work [illegible] It sets out to discuss how the general basic principles of pure first aid apply [illegible] the method of application being modified by the special circumstances of [illegible] The book is full of valuable and practical information in bridging [illegible] the gap between [illegible]

[illegible] VIII is particularly helpful [illegible] organization [illegible] parties [illegible] first aid party [illegible] and transport of the M.F.I. First Aid [illegible] Appendix II [illegible] self protection [illegible] suggested in connection with [illegible] with gas. Altogether [illegible] the first edition of which appeared in September 1941 has been [illegible] and in May of this year appeared [illegible] the second edition. It should [illegible] of those whose duties embrace first aid and all that this implies particularly [illegible]

H. [illegible] B.

FIRST AID THROUGH PHOTOGRAPHY. By L. S. Michaelis, M.D. Photographs [illegible] Elkan. New Impression 1943 of the First Edition 1941. Pp. 64. [illegible] Photographs. London: Longmans, Green & Co. Price [illegible]

This book is an [illegible] First Aid Illustrated. [illegible] the text and photography are entirely new. Its value lies in the [illegible] illustrations, all of which are taken from actual photographs [illegible] explanatory [illegible]. The standard attained is a high one and the [illegible] beautifully reproduced depict the application of [illegible] pressure points and splinting of fractures in a manner which [illegible]. The work is by no means complete and it is hoped that future editions will [illegible] the subject still further. Within its limitations [illegible] good; [illegible] it should be read in conjunction with some standard textbook on first aid.

B. F. B.

◆

# News of the Service.

## OBITUARY

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

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[illegible]

[illegible]

[illegible] entered the Naval [illegible] December [illegible] Superintending [illegible] to Haslar [illegible] During his [illegible] Hospital [illegible] Hospital [illegible] R.N. Hospital [illegible] R.N. M.H. [illegible] Depot in [illegible] February [illegible] 1921 he [illegible] the first [illegible] He [illegible] officer [illegible] exceptional [illegible] [illegible] Great War.

[illegible] Medical Department of the Navy [illegible] physician [illegible] appointed [illegible] Hospital [illegible]

[illegible] for his [illegible] Service [illegible] His [illegible] Admiralty [illegible] apparently [illegible] sought by [illegible]

[illegible] Medical Service and his [illegible] affection for him. He passed [illegible] Naval Medical Service [illegible]

[illegible] M.B., Ch.B., R.N.V.R., was born in [illegible] of Liverpool. He was educated at [illegible] College, Cambridge, where he qualif[illegible] House Surgeon [illegible] outbreak of war and was [illegible] went down with the ship.

[illegible] M.B., Ch.B., R.N.V.R., graduated at the [illegible] the University of Edinburgh [illegible] H.M.S. *Jersey*.

[illegible] M.R.C.S., L.R.C.P., R.N. (Retd.) was the [illegible] R.N. and qualified [illegible] 1901 and Surgeon [illegible] the [illegible]

[illegible] M.R.C.S., L.R.C.P., R.N., was [illegible] St. Bartholomew's Hospital [illegible] R.N.V.R. [illegible] H.M.S. [illegible]

[illegible] D.S.C., M.B., Ch.B., R.N., was born [illegible] Mrs. [illegible] He was [illegible] University of Edinburgh where he graduated [illegible] 1937 and after [illegible] *Surfing* [illegible] being awarded the D.S.C. [illegible] He was [illegible] on July 18 as [illegible] H.M.S. *Kelly* off Crete.

## PRISONER OF WAR

[illegible] William Groves, R.N.

## HONOURS

*Honorary Physician to the King*

[illegible]

[illegible] (Military Division)

[illegible]

O.B.E. (Military Division)

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Mentioned in Despatches

[illegible]

[illegible]

[illegible]

## DIPLOMA

[illegible]

## RETIREMENTS

[illegible] Nicholls [illegible] F.R.C.S. [illegible]

[illegible] W. A. Ry[illegible]

## PROMOTIONS

[illegible] Hedley [illegible] M.D. [illegible] F.R.C.S. D.P.H. [illegible] Surgeon Vice-Admiral [illegible] Medical [illegible] 1941.

[illegible] Surgeon Rear-Admiral [illegible] 1941.

[illegible] W. Baker M.B. [illegible] L.R.C.P. [illegible] 1941.

[illegible] Surgeon [illegible] July 24, 1941.

[illegible] Surgeon Lieutenant [illegible] 1941.

[illegible] W. H. C. Watson M.B. B.Ch. M.R.C.S. [illegible] Surgeon [illegible] July 24, 1941.

[illegible] Surgeon [illegible] August 19, 1941.

## TRANSEER TO PERMANENT LIST

[illegible] (Emergency) D. W. P[illegible] M.B. [illegible]

## WARDMASTERS

[illegible] W. H. Collins, M. A. Bell and A. G. Harrell [illegible] June 26, 1941.

## ROYAL NAVAL VOLUNTEER RESERVE

[illegible] Commander [illegible] T. Dalgman [illegible] appointment and commission [illegible] 1941.

[illegible] Lieutenant-Commander R. M. H[illegible] appointment and commission [illegible] 1941.

[illegible] Lieutenant J. Stewart [illegible] appointment and temporary commission [illegible] June 7, 1941.

[illegible] Lieutenant A. Griffiths [illegible] temporary commission [illegible] July 13, 1941.

[illegible] Surgeon Lieutenant [illegible] Denny [illegible] appointed [illegible] 1941.

[illegible] Surgeon Lieutenant [illegible] Watson [illegible] appointment [illegible] September 2, 1941.

### PROMOTIONS

[illegible] F. H. Parkinson M.B. Ch.B. [illegible] May [illegible] 1941.

[illegible] Commander [illegible] M.B. B.S. M.R.C.S. [illegible] Commander May 8, 1941.

[illegible] Commander R. A. M[illegible] Surgeon [illegible]

[illegible] M.B. Ch.B. [illegible] 1941.

[illegible] M.B., Ch.B. [illegible]
[illegible] N. Mort, M.B. [illegible]
[illegible]

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## QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

### HONOURS

Miss D. W. Beah, Matron-in-Chief, Q.A.R.N.N.S., R.N. Hospital [illegible] Royal Red Cross (R.R.C.)

Miss M. Goodrich, Matron, Q.A.R.N.N.S., awarded the Royal Red Cross [illegible]

Miss K. Baker, Matron, Q.A.R.N.N.S., awarded the Royal Red [illegible] (A.R.R.C.)

Miss I. B. Price, Matron, Q.A.R.N.N.S., awarded the Royal Red Cross [illegible] (A.R.R.C.)

Miss N. S. Garner, Acting Matron, Q.A.R.N.N.S., awarded the Royal Red Cross [illegible] class) (A.R.R.C.)

Miss K. M. Cooper, Superintending Sister, Q.A.R.N.N.S., awarded the Royal Red [illegible] (second class) (A.R.R.C.)

Miss R. Edges, Nursing Sister, Queen Alexandra's Royal Naval Reserve [illegible] awarded the Royal Red Cross (second class) (A.R.R.C.)

### PROMOTIONS

Miss D. W. Beah, R.R.C., Matron, Q.A.R.N.N.S., [illegible]

Superintending Sister Miss [illegible] Matron [illegible]

Superintending Sister Miss D. R. Martin [illegible] Acting Matron.

Acting Superintending Sister Miss [illegible] Superintending Sister [illegible] 1951.

Nursing Sister Miss [illegible]

Nursing Sister Miss M. [illegible]

Nursing Sister Miss M. [illegible] Superintending Sister.

Nursing Sister Miss [illegible] Superintending Sister.

Nursing Sister Miss [illegible]

Nursing Sister Miss F. M. [illegible] Superintending Sister.

Nursing Sister Miss [illegible] M. [illegible]

Nursing Sister Miss [illegible]

Nursing Sister Miss M. B. [illegible]

### APPOINTMENT

Matron-in-Chief Miss D. W. Beah, R.R.C., [illegible] R.N. Hospital [illegible] 1951.

Acting Matron Miss [illegible] R.N. Hospital [illegible]

Superintending Sister Miss [illegible] R.N. Hospital [illegible]

Acting Superintending Sister Miss [illegible]

Acting Superintending Sister Miss [illegible] R.N. Hospital [illegible]

Acting Superintending Sister Miss [illegible] Malta.

Nursing Sister Miss [illegible] R.N. [illegible] Hospital [illegible]

Nursing Sister Miss M. [illegible] R.N. [illegible]

Nursing Sister Miss I. M. [illegible] R.N. [illegible]

Nursing Sister Miss [illegible] R.N. Hospital [illegible]

Nursing Sister Miss [illegible] H.M. Hospital [illegible]

Nursing Sister Miss B. [illegible] R.N. [illegible]

Nursing Sister Miss M. [illegible] R.N. [illegible]

Nursing Sister Miss I. M. [illegible] R.N. [illegible] Hospital [illegible]

Nursing Sister Miss M. M. [illegible] R.N. Hospital [illegible]

Nursing Sister Miss F. I. McKay [illegible] H.M. Hospital [illegible]

Nursing Sister Miss I. M. [illegible] Hospital [illegible]

Nursing Sister Miss A. M. [illegible]

Nursing Sister Miss [illegible]

Nursing Sister Miss I. M. [illegible] R.N. [illegible]

### RETIREMENTS AND RESIGNATIONS

Matron [illegible] Q.A.R.N.N.S. Miss A. Ralph, R.R.C., retired July 17, 1941.

Nurs[illegible] (Retired) Miss H. T. Fox-Hervey, re-employment terminated [illegible] 1941.

Nursing [illegible] Miss E. M. Dillon, resigned July 16, 1941.

Nursing Sister Miss S. M. St. J. James, invalided August 27, 1941.

## ROYAL NAVAL MEDICAL CLUB

### Balance Sheet 1940-41

| | £ s d | | £ s d |
|---|---|---|---|
| Brought forward from August 1940 | 86 [illegible] 11 | Expenses | Nil |
| Received by Subscriptions | Nil | Certified Bank Balance | 104 0 [illegible] |
| Received by Dividends | 17 1[illegible] 6 | | |
| | £104 [illegible] | | £104 [illegible] |

Assets: Securities held by Lloyds Bank (Cox's and King's Branch):
£100 War Stock 3½
£[illegible] War Stock 3½%
£[illegible] 2½% Consolidated Stock
[illegible] Conversion Loan
£104 [illegible] Certified Bank Balance

H. L. ANTHONY,
*Hon. Secretary.*

The necessary receipts and vouchers against the above sums have been produced.

For Committee:

R. A. GRANT,
*Surgeon Commander.*

T. C. SOUTER,
*Surgeon Commander.*

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[illegible] R.N. [illegible]

[illegible] R.N.V.R. [illegible]

[illegible] Macdonald, R.N.V.R. [illegible]

[illegible] Surgeon [illegible] R.N.V.R. 84

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[illegible] R.N.V.R. 84

[illegible] Lieutenant Commander [illegible] 90

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